MINISTRY OF INTERIOR.

DEPARTMENT OF PUBLIC HEALTH.

Paper No. 3—1910.

ANNUAL REPORT

FOR

1909.

CAIRO :
NATIONAL PRINTING DEPARTMENT,
1910.

MINISTRY OF INTERIOR.

DEPARTMENT OF PUBLIC HEALTH.

ANNUAL REPORT FOR 1909.

INTRODUCTORY.

In compiling the following report it was at first intended, owing to pressure of time and administrative exigencies, to limit it for the greater part to statistical tables supplemented at most by short notes on such matters as did not offer facility for description in figures.

It was subsequently found, however, that two conditions presented themselves which necessitated an alteration in the original intention.

In the first place, as no report had been issued since 1906 it was found advisable in certain cases to trace events in the intervening years; and in the second place it was realized, in view of the more prominent interest attaching to certain matters, that it was impossible to dismiss them with a mere cursory or passing notice.

The schedule given below indicates in a tabular way the somewhat wide field of duties and interests which are dealt with in the routine of public health administration in this country. It will readily be realized that it is not possible, within the necessarily restricted limits of an ordinary annual report, to give exhaustive attention to all the subjects included in this schedule; and there are therefore, for the reasons given above, two circumstances which will be found to characterize the general complexion of this report and which must be taken into account by the reader; these are, firstly, the fact that certain of the matter is not strictly applicable to the year 1909 (in which case an intimation is conveyed in the text), and secondly, the manner in which each subject is treated is by no means uniform, and therefore that clear-cut proportion and consistency which is otherwise desirable in such official reports is necessarily at times lacking.

The following is the schedule referred to above :—

PRELIMINARY.

Ordinary Budget for the Year. Additions to that of 1908.
Special Credits (*a*) Buildings and new works;
(*b*) Plague and Rinderpest.
Internal Administration and Organization.

Part I.—MEDICAL ADMINISTRATION.

A.—General Provisions for Medical Aid.

(i) General Hospitals.
(ii) Infectious Hospitals.
(iii) Dispensaries.
(iv) Pharmacies and Pharmacy Law.
(v) Medical Practice and Authorizations.
(vi) Medical Education.

B.—Special Departments.

(i) Lunatic Asylum and Administration in Lunacy.
(ii) Ophthalmic Hospitals.
(iii) Medico-Legal Reports.
(iv) Medical Commission (Cairo, London, Paris).
(v) General Stores for Equipment and Supplies.

Part II.—PUBLIC HEALTH.

A.—General Considerations.

(i) Census
(ii) Registration of Births and Deaths.
(iii) Village Barbers and Organization.
(iv) Kuttabs.
(v) Infantile Mortality.

B.—Infectious Diseases.

(i) Plague.
(ii) Small-pox and Vaccination.
(iii) Typhus.
(iv) Relapsing Fever.
(v) Measles.
(vi) Diphtheria.
(vii) Enteric and Allied Fevers.
(viii) Malaria and Mosquitoes.

C.—Sanitary Defence.

(i) Passenger and Immigrant Control.
(ii) Pilgrims and the Pilgrimage.

D.—General Sanitary Measures.

(i) Birkets.
(ii) Mosques and Public Baths.
(iii) Cemeteries.
(iv) Unhealthy Establishments.
(v) Fairs and Markets.

E.—Municipalities and Local Commissions.

(Treated generally from a Public Health aspect.)

F.—Governorates.

(i) Cairo : (*a*) Water, (*b*) Drainage, (*c*) Conservancy.
(ii) Alexandria „ „ „
(iii) Port Said „ „ „
(iv) Suez „ „ „

G.—Mudirias and Provincial Councils.

Local conditions regarding (*a*) Water Supply, (*b*) Drainage, (*c*) Conservancy.

Part III.—SCIENTIFIC ESTABLISHMENTS.

(i) Hygienic Institute and Bacteriological Laboratories.
(ii) Vaccine Institute.
(iii) Antirabic Institute.
(iv) Khedivial Chemical Laboratory.
(v) Serum Institute.
(vi) Original Investigations and Research.

Part IV.—VETERINARY DEPARTMENT.

(i) Contagious Diseases of Animals (general).
(ii) Cattle Plague.
(iii) Abattoirs.
(iv) Census of Cattle.
(v) Importation of Animals and Meat.
(vi) School of Veterinary Medicine.
(vii) Veterinary Legal cases.

Part V.—ENGINEER'S DEPARTMENT.

Buildings; New Works; Repairs; Projects.

Part VI.—LEGISLATION.

(i) Health Legislation in general.
(ii) Practice of Medicine.
(iii) Lunacy Law.
(iv) Infectious Diseases.
(v) Laws for regulating the purity of food and drink and the unhealthy establishments.
(vi) Pharmacy law.
(vii) Cemeteries.
(viii) Decree regulating Births and Deaths.
(ix) Decree regulating the Latrines of Mosques.
(x) Amendment of the Vidange Regulation.

CONCLUSION.

PRELIMINARY.

ORDINARY BUDGET.

The Ordinary Budget (recurrent expenditure), was fixed at	L.E.	291,405
That for 1908 was	„	278,244
Showing an increase of	L.E.	13,161
Which was distributed as follows :—		
i. Increase of personnel (pensionable)	L.E.	5,718
ii. Hospital and General Supplies	„	6,014
iii. Automatic increase in the Cairo Scavenging and Watering Service ...	„	1,470
	L.E.	13,202
Less decrease on personnel (non-pensionable)	„	41
	L.E.	13,161

The following table indicates in a general manner the credits allotted to the individual or correlated Services of the Department, and affords a comparison with the corresponding credits alloted in 1908 :—

	1909	1908
	L.E.	L.E.
A. Personnel :		
1. Direction-General	19,809	18,839
2. Central Stores and attached Services	5,133	4,617
3. Scientific Laboratories and Institutes	4,520	4,454
4. Ophthalmic Hospitals *	1,424	1,296
5. Inspectorate of Pharmacies	1,422	1,320
6. Provincial Hospitals and Inspectorates	52,196	49,397
7. Provincial Barbers	1,500	1,500
8. Cairo Inspectorate	10,307	9,135
9. Cairo Hospitals (including Lunatic Asylum)	18,287	17,689
10. Alexandria Hospitals...	4,323	4,149
11. Veterinary Service †	12,311	14,309
B. Equipment	22,627	20,910
C. General snpplies and diets	38,419	34,134
D. Travelling charges and allowances	8,440	8,440
E. Various indemnities and allowances...	9,049	8,348
F. Free water fountains	3,278	3,278
G. Prophylactic measures	5,198	5,740
H. Repairs and maintenance of buildings	7,050	7,050
I. Sanitation of mosques	2,500	2,500
J. General expenses : forage, rent, light, water, printing, post, telegrams, telephones, etc.	16,240	15,237
K. Cairo Scavenging and Watering Service	47,372	45,902
TOTALS...	291,405	278,244

On this Budget, the total expenditure (1909) was	L.E.	283,113
Showing an economy, which reverts to the State Treasury, of ..	L.E.	8,292

* In addition to L.E. 2,568 provided by the income of the Cassel Fund.

† Reduction in 1909 partially due to transfer of Abattoirs to Municipalities and Local Commissions.

SPECIAL CREDITS

Item.	Balance end of 1908.	Credit accorded in 1908.	Total.	Expended.
	L.E.	L.E.	L.E.	L.E.
Khanka Asylum *	15,076	30,000	45,076	15,076 17,999
Abbassia Asylum	7,724	7,796	15,520	7,098 2,168
Alexandria Hospital Works...	3,458	...	3,458	1,005
Mersa Matruh building extension	500	...	500	409
Filling in Birkehs	1,998	2,000	3,998	1,998 373
Improvement of Cemeteries...	3,655	1,110	4,765	2,783 110
Plague and Rinderpest...	9,165	42,500	51,665	9,165 29,825
Cholera Credit...	827	...	827	827
Cattle Shelter at Shellal	1,395	...	1,395	...
Assiut Ophthalmic Hospital (special credit). ...	5,003	...	5,003	...
Ophthalmic Hospital Building	4,091	...	4,091	3,819
Ophthalmic Hospital Equipment	1,568	...	1,568	
Land for Ophthalmic Hospital	1,464	...	1,464	1,279
Public Abattoirs	1,430	...	1,430	498
Balance for Surgical Pavilion at Alexandria ...	660	...	660	660
Infectious Pavilion, Benha...	568	...	568	144
Infectious Hospital, Alexandria	9,120	...	9,120	...
Balance of Antirabic Fund	2	...	2	2
Extension of Departmental offices	...	2,850	2,850	...
Stores Buildings	...	5,352	5,352	2,035
Credit for Quarantine Board	...	8,150	8,150	8,150
Totals	67,704	99,758	167,462	105,423

INTERNAL ORGANIZATION AND ADMINISTRATION.

The Department as it now exists is but of recent date. Its predecessors were evidently not considered sufficiently reliable to inspire Europe with that confidence which would have rendered unnecessary international action in the sanitary protection of Egypt against the East, and incidentally of Europe against Egypt.

The "Conseil de Santé" of early days underwent periodical modification. The "Direction Sanitaire" (1881) was the product of a later effort to institute a more modern

* Khanka Asylum is being constructed by the Public Works Ministry. The remainder of the buildings and other works by the Engineer's Office of this Department.

type of sanitary authority, but it required the cholera and cattle plague of 1883 to convince the Government that serious re-organization was necessary. It was then, after much consideration, that the present Department was founded in 1886, by the Decree that constituted the " Administration d'Hygiène Publique relevant du Ministère de l'Intérieur."

The foregoing schedule gives a comprehensive and tabular indication of the many and varied interests that have come to be the concern of the Department. It remains to describe the organization by which those interests are dealt with.

In the main the organization follows the usual administrative organization of the country, that is to say, there is in Cairo a Central Administration, attached to the Ministry of the Interior ; at the headquarters of each province there is the Mudiria Health Authority (inspectorate) attached to the Mudiria ; in the districts (Markazes) there is the District Medical Officer and (but here the organization is seriously inadequate) in the villages there is the official (but upaid) " barber."

Veterinary Officers are also provided in the Mudirias and in some Mudiria towns. General Hospitals exist in all Governorates and Mudiria towns, and Infectious and Ophthalmic Hospitals are distributed in certain of the more favoured of these localities ; while one large asylum and a second nearly completed, are installed in the neighbourhood of Cairo for the accommodation of the insane. Further, there are at headquarters in Cairo certain special technical institutions which are necessary for dealing with the more highly technical questions of public health administration.

Reference to the schedule will demonstrate the fact that to deal with the interests therein detailed the functions of the Department must be both consultative and administrative ; consultative in those matters that are administered by other Ministries, Departments or local bodies, and administrative in those matters that concern the internal arrangement of its own institutions and in all those questions of public health legislation and regulation that are so intimately associated with the daily life of the people.

In a general way it may be said that consultative duties are carried out by the Direction-General in collaboration with the special branch (of this Department) interested, and are communicated direct to the Department concerned, or in the case of a local body, through its superior authority.

As regards administrative duties, these are commonly divided into two sections :—

1. Ministerial : which include new questions of policy, of finance or of routine matters of special importance, and involving other Departments or authorities. Business of this nature is transacted in consultation with, and through the Minister.

2. Intra-departmental : which includes the administration of departmental institutions throughout the country, and the routine administration of public health law and regulations. Business of this kind is transacted by the Direction-General directly with the authority concerned.

It will be readily understood that for dealing satisfactorily with all these matters an extensive staff of highly trained men is necessary, as well as a certain number of the artizan class, of the semi-skilled labourer, of the ordinary labourer, and in addition, the necessary clerical element.

The following table gives the establishment of the present staff and personnel of the Department, and numerous and diverse though it be, it may be said with confidence that in many respects it is still inadequate and over-worked.

STAFF AND PERSONNEL OF THE DEPARTMENT OF PUBLIC HEALTH FOR 1909.

No.	Category.
	" Personnel classé."
1	Director-General.
1	Deputy Director-General.
1	Secretary-General.
4	Inspectors, 1st class. *
1	Inspector (special class). †
10	Divisional inspectors. ‡
8	Inspectors, 2nd class. §
16	„ 3rd „ §
107	„ 4th class. **
1	Sanitary Engineer, 1st class.
1	„ „ 2nd „
1	„ „ 3rd „
1	Bacteriologist, 1st class.
3	Bacteriologists, 2nd „
1	Chemist.
1	Alienist, 1st class.
1	„ 2nd „
3	Medical Officers, 1st class.
3	„ „ 2nd „
8	„ „ 3rd „
60	„ „ 4th „
49	Sages-femmes.
1	Director of Stores.
1	Pharmacist, 1st class.
1	„ 2nd „
3	„ 3rd „
14	„ 4th „
302	*Carried over.*
302	*Brought forward.*
1	Veterinary Inspector, 1st class. ††
3	„ Inspectors, 2nd „
5	„ „ 3rd „
2	„ „ 4th „
10	„ „ 5th „
19	„ „ 6th „
1	Chief Inspector. ‡‡
2	Inspectors.
1	Assistant Inspector.
1	Inspector of Vidanges.
	CLERICAL STAFF.
1	Director of Service.
3	Sub-Directors of Services.
2	Chefs de Bureau.
5	Sous-Chefs de Bureau.
7	Employees, 1st class.
18	„ 2nd „
38	„ 3rd „
115	„ 4th „
2	Store-keepers, 1st class.
2	„ „ 2nd „
1	„ „ 3rd „
4	„ „ 4th „
445	TOTAL.

No.	Category.
	" Hors Cadre " and Special Credits.
21	Medical Officers.
4	Inspectors.
2	Matrons.
29	Nursing Sisters.
40	Chief Attendants.
384	Male Attendants.
146	Female Attendants.
101	Sanitary Barbers.
3	Electricians.
4	Assistants Electricians.
8	Mechanics.
2	Laboratory Assistants, 1st class.
744	*Carried over.*
744	*Brought forward.*
2	Laboratory Assistants, 2nd class.
1	„ Assistant, 3rd „
2	„ Assistants, 4th „
10	Disinfectors, 1st class.
37	„ 2nd class.
118	Clerks.
42	Cooks.
2	Printers.
880	Other employees and artisans of various trades.
1838	TOTAL.

* Including Chief Inspector of Ophthalmic Section.
† Medical Officer Cairo City.
‡ Including Second Medical Officer Cairo City and Medical Officer Port-Said City.
§ Inspectors of Mudirias.
** District Medical Officers.
†† Chief Inspector of Veterinary Section.
‡‡ Cairo City Service.

The Central Administration, besides the Direction-General, embraces three administrative sections (A, B and C) together with the special branches above mentioned.

The personal duties of the Deputy-Director-General include the supervision of all matters concerning the personnel, their attributes and distinctive duties, village barbers and sages-femmes, the issuing of authorizations to practise medicine, pharmacy, dentistry, etc., stores, contracts, and the Public Health Inspectorates in the provinces.

The duties of the three sections above referred to may be tabulated as follows :—

Section A.—Epidemics, ambulances, disinfection, transport of " suspect " or dangerous

matter, vaccination, pilgrims, " muleds," legislation, " Décrets et Règlements," Departmental Orders, Circulars, administrative printing.

Section B.—Unhealthy establishments, mosques, birkets, ezbehs, cemeteries, fencing of waste ground, medico-legal reports, " service des mœurs," and other general sanitary questions not above defined.

Section C.—Hospitals, dispensaries, medical commission, library, reviews and periodicals.

The normal organization of the Department has now been outlined, but in order to make it effective in the provinces some further impulsive and directing power has been found necessary. This requirement is supplied by a small body of Divisional Inspectors whose duties are :—

1. To act in the provinces as the eyes and ears of the Central Administration.

2. To perform the duties of instructors to the provincial and district officials of the Department, and sanitary advisers to the local Administrative authorities.

This body is in reality the successor to the " Inspectors " of earlier years, and exists in consequence of the peculiar circumstances of administration in Egypt ; though it does not form a definite link in the chain of decentralized action (since the Mudirias are in direct communication with the Central Administration), the members are perhaps the hardest worked officials of the Department ; they are called upon to act with promptness and consideration in a variety of circumstances, to exhibit much energy and forethought, more especially in the frequent emergencies that are inseparable from the prevalence of plague and other epidemic disease ; they are required by the combination of tact, conciliation and firmness to secure the adherence of local authorities and of the people to such measures as may be necessary in cases of difficulty ; and altogether must be reckoned as the most important factor in promoting efficiency of sanitary and medical administration in this country.

I specially mention this body of officials because of recent years if it had not been for their devotion to duty, maintained under many hardships of climatic and other circumstances, the epidemic of plague which has been persistent in this country could by no means have been kept within the limits which have been set to it.

Of this small body no fewer than four (Dr. White, Dr. Rowntree, Dr. Unsworth, and Dr. John Garner), have in recent years lost their lives while in execution of their duties as Divisional Inspectors, while another Inspector has more recently been invalided as the result of disease contracted in the course of his labours in the provinces.

PART I.—MEDICAL ADMINISTRATION.

A.—GENERAL PROVISIONS FOR MEDICAL AID.

(i) General Hospitals.

The steady development of the work of the Government Hospitals and Dispensaries which has consistently been noted year by year, shows no sign of abating, but, as figures given below demonstrate, it appears rather to have gathered impetus in its progress.

The total number of *in-patients* treated during 1909 in the various Government Hospitals (excluding the Ophthalmic Establishment), amounted to 36,787, as against 33,241 in 1908 ; the number of days treatment amounted to 989,089, as against 904,023 in 1908.

As regards the *out-patient* Department, a branch of medical aid which some efforts have been made to encourage and extend, the total number of new patients seen was 144,509, while the total number of attendances (new and old patients) was 353,409, as against 202,580 in 1908.

As regards dispensary practice in the districts some 33,000 persons have been attended gratuitously by the District Medical Officers.

It is satisfactory to be able to register the fact that in addition to an increase in the quantity of work done there is also, in most hospitals, a progressive improvement during recent years in the quality of the work, which is largely attributable to the excellence of the course of education given at the Medical School.

The recognition of this fact necessarily suggests the idea of providing a wider and more responsible professional career for those Medical Officers of provincial hospitals who distinguish themselves by the excellence of their work, and by their interest in the higher and more specialized branches of their profession.

Hitherto it has only been possible to offer this opportunity on the rare occasions on which vacancies in a certain few posts occurred at Kasr el Aini Hospital (Cairo). A scheme has now been developed for the improvement and extension of Alexandria Hospital, and the concomitant appointment to important posts (as vacancies occur), of Egyptian Medical Officers selected from the various provincial hospitals.

It was anticipated that the first step in this scheme should have been taken this year (1910), but as the credit was not available, it has been necessary to effect a temporary postponement until such time as funds (some L.E. 1,000 per annum) shall be forthcoming.

As regards hospital buildings, in view of the frequency with which attention has been drawn to the fact, it is not necessary to dwell on the entire inadequacy of Kasr el Aini to fill its rôle as the largest and most important hospital in the country—the seat of the Medical School, and the headquarters of the profession in the Metropolis. There is no doubt that as soon as it is at all possible to secure funds its reconstruction should take place on a scale that shall be commensurate with the importance of its various functions.

The preparation of a comprehensive scheme for the rebuilding and re-arrangement of a hospital of this size must necessarily occupy some time, and in order that none should be lost when funds become available, it would be advantageous to put the plans under study at once.

Kena and Esna Hospitals are also in a most dilapidated condition, and are unsuitable for the modern treatment of disease and injury. A new hospital should be built at Kena as soon as possible ; Esna to follow whenever the necessary credit (not a large one) is available.

The usual difficulty of obtaining hospital and asylum attendants of a suitable class has recently been a specially prominent one, as a result of the considerable increase of pay given to the Police, which now attracts some of the best of those who formerly entered hospital service ; this is particularly the case with time-expired men of the Medical Corps of the Army, which formed at one time a very useful recruiting ground for the Department. These men now prefer to join the Police force with higher pay and shorter hours of duty.

Though some of the existing attendants are decidedly useful men, there are very many of an inferior type, both educationally and otherwise. In view of the amount of money expended on a trained medical staff, good buildings, expensive equipment and materials, it is desirable to endeavour to obtain sufficiently skilled labour to avoid waste, damage and destruction, as well as to secure as good results as possible in the work of the hospitals.

The question of forming a training school for hospital attendants is perhaps somewhat premature, but much good might be done by making the service more attractive, and organizing from time to time courses of instruction ; but such proposals necessarily involve additional expenditure.

The following tables give detailed statistics of hospital and dispensary work for the year :—

TABLE I.

PATIENTS.—NUMBER OF BEDS.—DAYS TREATMENT.

LOCALITY.			YEAR. 1908			1909		
			Patients treated.	Beds.	Days treatment.	Patients treated.	Beds.	Days treatment.
Governorates	Cairo	Kasr el Aini	8,161	659	182,258	8,919	670	182,045
		Lunatic Asylum ...	1,489	877	347,480	1,070	908	390,550
		Infectious Hospital	663	110	11,430	1,081	170	24,384
	Alexandria		5,296	261	80,300	5,676	288	78,855
	Damietta		743	45	12,944	732	46	12,230
	Port Said		1,858	171	26,589	2,192	174	30,155
	Suez		1,392	98	7,298	1,432	91	9,836
Lower Egypt	Kaliub		474	30	8,457	464	35	9,096
	Benha		580	50	11,539	665	51	14,760
	Zagazig...		960	79	16,888	1,184	79	22,932
	Tanta		1,482	114	30,409	1,800	129	33,179
	Mansura		1,374	93	25,552	1,373	95	22,413
	Shibin el Kom		730	60	15,895	697	61	16,515
	Damanhur		1,212	61	15,035	1,229	64	35,306
	Marsa Matruh		164	10	1,457	132	12	1,679
Upper Egypt	Fayum		686	40	9,793	671	41	10,390
	Beni Suef		595	46	9,232	669	47	9,438
	Minia		958	51	17,304	971	52	15,196
	Assiut		2,119	140	37,487	2,165	136	35,426
	Sohag		811	50	14,383	970	52	16,042
	Kena		542	31	9,333	477	31	7,542
	Esna		236	25	4,618	184	26	3,157
	Aswan		716	39	8,342	538	41	7,963
TOTAL			33,241	(*a*)3,140	904,023	35,291	(*b*)3,399	989,089

(*a*) Not including Ophthalmic Hospitals ... Tanta ... ... beds 9; Travelling Hospitals ... Mansura ... ... 10, Giza 12

(*b*) ... ... beds 29
Beni Suef 35
Luxor 30

TABLE II.

PATIENTS ADMITTED DURING 1909.

HOSPITALS.	Voluntary cases.	Days of treatment.	Police cases.	Days of treatment.	Total No. of cases.
Kasr el Aini	5,427	105,968	3,492	76,077	* 8,919
Alexandria	3,533	48,507	2,143	30,348	5,676
Damietta	452	8,867	280	3,363	732
Port Said	1,632	22,754	560	7,401	2,192
Suez	1,149	6,440	283	3,396	1,432
Kaliub	447	8,833	17	263	464
Benha	116	2,123	549	12,637	665
Zagazig	172	3,593	1,012	19,339	1,184
Tanta	815	13,851	985	19,328	1,800
Mansura	531	8,836	842	13,577	1,373
Shibin el Kom	207	4,456	490	12,059	697
Damanhur	491	17,672	738	17,634	1,229
Beni Suef	205	3,542	464	5,896	669
Fayum	167	2,552	504	7,838	671
Marsa Matruh	120	1,500	12	179	132
Minia	308	5,269	663	9,927	971
Assiut	902	14,044	1,263	21,382	2,165
Suhag	104	1,847	866	14,195	970
Kena	25	389	452	7,153	477
Esna	57	1,310	127	1,847	184
Aswan	138	2,118	400	5,845	538
Lunatic Asylum	...	...	1,070	390,550	† 1,070
Infectious Hospitals	1,000	22,588	81	1,796	1,081
TOTAL	17,998	307,059	17,293	682,030	35,291

Total number of days of treatment 989,089.

* Including 311 from last year. † New and old.

TABLE III.

IN-PATIENTS DIVISION 1909.

HOSPITALS.	ADMITTED.			DISCHARGED.			Remaining	TREATMENT FEES.	
	Remaining from last year.	Admitted during the year.	Total.	Cured.	Died.	Improved		L.E.	Mills.
Kasr el Aini	311	8,545	8,856	4,473	744	3,204	435	519	587
Alexandria	203	5,676	5,879	2,627	321	2,724	207	387	942
Damietta	26	732	758	692	20	10	36	83	128
Port Said	79	2,191	2,270	1,747	101	325	97	1,462	531
Suez	23	1,513	1,436	1,225	99	053	59	842	686
Kaliub	17	464	481	159	22	278	22	22	600
Benha	32	665	697	487	40	127	43	114	340
Zagazig	49	1,177	1,226	1,135	49	—	42	111	625
Tanta	74	1,800	1,874	1,458	156	196	64	389	398
Mansura	64	1,373	1,437	1,225	60	93	59	327	505
Shebin el Kom	41	697	738	611	38	47	42	176	802
Damanhur	45	1,352	1,397	734	110	521	32	286	70
Beni Suef	21	669	690	557	37	67	29	128	295
Fayum	20	671	691	550	28	93	20	91	680
Marsa Matruh	5	132	137	76	3	55	3	14	580
Minia	40	971	1,011	766	37	172	36	112	235
Assiut	72	2,165	2,237	1,776	151	232	78	443	77
Sohag	45	970	1,015	887	47	41	40	178	600
Qena	26	451	477	415	28	14	20	52	635
Esna	3	184	187	141	10	25	11	9	880
Aswan	13	537	550	448	24	50	28	135	648
Lunatic Asylum	1,017	578	1,595	162	108	175	1,150	3,929	274
Infectious Hospital	67	1,081	1,148	907	162	59	20	411	865
TOTAL	2,293	34,494	36,787	23,258	2,395	8,561	2,573	10,231	983

TABLE IV.

Out patients Division.

Hospitals.	Number of patients.	Number of attendances.	Amount collected.		Hospitals.	Number of patients.	Number of attendances.	Amount collected.	
			L.E.	M.				L.E.	M.
Kasr el Aini ...	45,826	76,626	697	811	*Brought forw.*	111,766	252,845	1,307	284
Alexandria... ...	11,046	21,513	180	210	Damanhur.. ...	970	1,041	...	...
Port Said	14,680	31,826	206	24	Mersa Metruh...	346	346	8	350
Suez	4,357	9,892	33	637	Beni Suef... ...	3,206	16,000	32	370
Damietta	5,193	22,926	65	640	Fayum	5,296	10,735	36	630
Kaliub	6,962	6,962	10	760	Minia	5,203	16,492	19	480
Benha...	4,906	11,388	1	200	Assiut	5,683	22,550	61	992
Zagazig	5,512	12,650	13	585	Sohag	1,555	9,672	3	10
Tanta	4,956	19,127	75	530	Qena...	5,481	5,481	39	551
Mansura	6,300	9,519	3	202	Esna	3,500	16,000	70	781
Shebin el Kom ...	2,028	29,416	19	685	Aswan	1,503	3,247	18	313
Carried over.	111,766	251,845	1,307	284	Total ...	144,509	353,409	1,597	761

(ii) Infectious Hospitals.

Infectious hospitals exist as separate institutions in some of the principal towns, as annexed to general hospitals in others, while in the remainder there is no special provision, and on the occurrence of outbreaks of infectious disease arrangements for accommodation and treatment have to be made, as in the districts, by the ambulance service.

The Cairo Infectious Hospital is provided with 170 beds for the poorer classes, but no accommodation exists for patients of a superior class. A scheme for the provision of such accommodation is now under consideration of the Government.

Alexandria is also deficient in accommodation for infectious disease; negociations are in progress with the Municipality for the solving of this very important and urgent question.

Infectious hospitals, or annexes, also exist at Port Said, Suez, Damanhur, Tanta (the gift of the late Menshawi Pasha), Shebin el Kom, Benha and Minia; but Zagazig, Mansura, Damietta, Beni Suef, Medinet Fayum, Assiut, Sohag, Kena and Aswan (all with the exception of Damietta chief towns of Provinces) are still in want of permanent provision.

The following tables (V and VI) give certain statistics regarding the incidence of infectious disease and the ambulance hospitals provided for:—

TABLE V.

Infectious diseases notified by the Medical Officers.

Ambulance Service.

	1908				1909			
	Existing.	Admitted.	Total.	Died.	Existing.	Admitted.	Total.	Died.
Small-Pox	69	2,509	2,578	521	143	3,740	3,883	751
of whom in Infectious Hospital, Cairo ...	...	189	189	36	40	264	304	62
Measles	62	2,256	2,318	1,216	16	4,226	4,242	2,235
of whom in Infectious Hospital, Cairo ...	...	6	6	1	...	32	32	3
Diphtheria	6	442	448	223	6	937	943	472
of whom in Infectious Hospital, Cairo ...	...	45	45	30	...	74	74	41
Typhic Fevers...	198	3,671	3,869	811	113	4,343	4,456	1,167
of whom in Infectious Hospital, Cairo ...	1	72	73	24	5	220	225	25
Plague	11	1,511	1,522	780	17	513	530	207

TABLE VI.

List of Fever Ambulances issued during 1909.

No. of beds.	Localities.	District.	Date.
10	Tukh Mazid	Santa	10 Jan. 1909.
10	Grais	Ashmun	20 „ „
20	Shabas Imair	Dessuk	24 „ „
20	El Warak	Kafr el Sheikh	25 „ „
20	Chabsheer	Tanta	31 „ „
50	Tanta Prisons	Tanta	25 Feb. „
20	Absum	Kom Hamada	20 „ „
20	Nashart	Kafr el Sheikh	25 „ „
20	Surad	Tanta	28 „ „
20	El Hammad	Rosetta	8 March „
10	El Yahudia	Dilingat	10 „ „
10	Shimyatis	Tala	17 „ „
10	El Nikaidi	Kom Hamada	17 „ „
10	Kamha	Delingat	17 „ „
20	Naga Abduna	Aswan	17 „ „
10	Ashma	Shibin	17 „ „
10	El Burigat	Kom Hamada	17 „ „
10	Zagazig Prisons	Zagazig	22 „ „
20	Tod	Kom Hamada	24 „ „
20	El Ikhmas	Kom Hamada	25 „ „
10	El Tawfikia	El Raml	31 „ „
20	El Iwaga	Damanhur	14 April „
10	El Soba el Sharkia	Kom Hamada	15 „ „
10	Tukh Tambisha	Kuesna	18 „ „
10	Nikla el Inab	Etai el Barud	18 „ „
10	Binufar	Kafr el Zayat	24 „ „
15	Shiat Kash	Mina el Kamh	24 „ „
10	Sangar	Menuf	29 „ „
20	Kafr el Sheikh	Kafr el Sheikh	1 May „
10	Misan	Dilingat	1 „ „
20	Shobak Ikras	Hihia	3 „ „
10	Shubra Kibala	Kuesna	5 „ „
15	Gizaï	Menuf	5 „ „
10	Kafr el Sheikh Shehata	Tala	8 „ „
10	Izbet Nessim	Dilingat	10 „ „
20	Sinn el Kubra	Zifta	10 „ „
20	Kuesna	Kuesna	12 „ „
10	Gizaï	Menuf	13 „ „
10	Madbul	Kafr el Sheikh	13 „ „
10	Abu el Rish Kibhi	Aswan	16 „ „
10	Ekwa	Tala	18 „ „
20	El Kisria	Samannud	20 „ „
20	Iflaka	Damanhur	20 „ „
10	Izbet Fadel Pasha	El Barud	22 „ „
20	Difra	Tanta	24 „ „
10	Beni Suef	Beni Suef	24 „ „
20	Izbet Abdel Hamid	Kafr el Dawar	26 „ „
10	Kafr Mistinad	Shubrakhit	30 „ „
10	Kafr el Arab	Tala	30 „ „
10	Kafr Misaïd	Etai	30 „ „
10	Kafr Tabliha	Tala	31 „ „
20	Etshai	Kafr el Zayat	6 June „
10	Mnrkos	Shubrakhit	10 „ „
20	San el Hagar	Bassiun	21 „ „
10	Abu Rukaya	Ashmun	30 „ „
40	Maghagha Prisons	Maghagha	15 Aug. „
15	Tamalai	Menuf	16 „ „
10	Tukh Dakla	Tala	24 „ „
20	Tamalai	Menuf	30 „ „
15	Ibgiq	Kuesna	6 „ „
10	Zawyat Garawan	Menuf	4 Dec. „
10	Bekaia	Tala	4 „ „
10	Dilingat	Delingat	28 „ „
940			

Medicine chests without equipment: 30.

TABLE VI *a*.

List of Small Pox Ambulances 1909.

No. of Beds	Localities.	Date.	District.
10	Izbet Abu Fatma	10 Jan. 1909.	Kom Hamada.
10	Ibgeeq	14 „ „	Kafr el Zayat.
10	Izbet Hassan Khalil	20 „ „	Damanhur.
10	Babil...	20 „ „	Tala.
20	El Mahalla el Kobra	24 „ „	Mahalla.
20	Mit Yazid	24 „ „	Santa.
10	Shisht el Anam	25 „ „	Etai el Barud.
10	El Khawalid	25 „ „	Etai el Barud.
10	Fisha el Soghra	31 „ „	Menub.
20	Saft Khalid	31 „ „	Etai el Barud.
10	Izbet Hassan Khalil	4 Feb. „	Damanhur.
10	Tinsa...	4 „ „	Beni Suef.
10	El Khiaria	8 „ „	Mansura.
30	Um Khinam	8 „ „	Giza.
10	Kafr el Shawam	8 „ „	Embaba.
10	Mit el Ibsi	28 „ „	Kuesna.
10	Abu Manguq	4 March „	Shubrakhit.
10	Mit Tukh Dagla	8 „ „	Tala.
10	Kafr Ganzur	15 „ „	Tala.
10	Milecq	17 „ „	Shebin.
4	Izbet Tura	28 „ „	Helwan.
10	Eshleem	29 „ „	Kuesna.
10	Kom Mohanna	31 „ „	Kafr el Zayat.
10	Ganzur	31 „ „	Tala.
10	El Makatii	31 „ „	Shebin.
10	Binufar	14 April „	Kafr el Zayat.
15	Beni Suef	26 „ „	Beni Suef.
20	Izbet el Maamuri	29 „ „	Kafr el Dawar.
10	Kafr Abshish...	30 „ „	Kuesna.
10	Mit el Kiram	1 May „	Tala.
15	Shubrawiin	10 „ „	Hihia.
10	Kafr el Arab el Bahari	10 „ „	Tala.
10	El Kanayis	24 „ „	Kafr el Dawar.
20	Izbet Ashur	25 „ „	Zagazig.
10	Shubra Awsim	26 „ „	Kom Hamada.
10	Izbet Yunis	25 July „	Simbillawain.
10	Kafr el Abhar	29 „ „	Talkha.
10	Mit Zimkor	5 Aug. „	Talkha.
10	Mit Khakan	14 „ „	Shebin.
20	Kom el Iais	3 Oct. „	Ashmun.
20	Damro	30 Nov. „	Mahalla.
10	Izbet Ferhaw...	30 „ „	El Raml.
10	Bishmu	1 Dec. „	Sennures.
20	Abu el Rish	5 „ „	Aswan.
10	Garadu	7 „ „	Etsa.
10	El Halabia	16 „ „	Beni Suef.
20	El Maasara	30 „ „	Bilkas.
584			

Also 40 medicines boxes, without equipment, were issued to various localities during the year.

Total beds	940	Fever Ambulances
	584	Small Pox
Grand Total... ...	1,524	

(iii) Government Dispensaries.

In addition to the provision of the out-patient departments of established hospitals, an endeavour is made to bring simple medical aid within reach of people even in the most distant villages; and it has been recognized that every Medical Officer of a Markaz should be afforded the means of practising his profession and of giving such aid in accidents and emergencies as may legitimately be expected to be at his disposal.

In the earlier days of the Department, the then Director-General (Sir John Rogers, K.C.M.G.), arranged for a scheme by which any approved qualified medical practitioner could obtain from the Department the installation of a properly-fitted pharmacy and first aid equipment, on sufficient pecuniary guarantees being forthcoming. The applicant then became the tenant of the Department, paying an annual sum towards liquidation of the costs of the establishment, which was open to inspection by the agents of the Department, from which (for the purpose of ensuring the good quality of the material) the applicant was obliged to obtain all drugs and dressings. This scheme was brought into operation and resulted in much good being done, but owing to the extension and development of the Department and the building of improved Markaz offices, it has been found more convenient and desirable to establish, in connection with the Medical Officer's office, a small dispensary in each new Markaz building, as progressive construction took place. The original scheme has consequently been relinquished, and the aim of the Department is now to have a fully-equipped dispensary and first aid establishment in each Markaz at the disposal of each Markaz Medical Officer, thus fulfilling the double purpose of bringing medical aid to the people of distant areas, and of giving the Medical Officer a fair opportunity of practising the clinical side of his profession which might otherwise suffer from the relatively large amount of police and other routine duties that fall to his lot.

Table VII gives the detailed statistics of this work.

TABLE VII.

No. of patients treated gratuitously in Government dispensaries in 1909.

Dispensaries.	No. of patients.	Dispensaries.	No. of patients.	Dispensaries.	No. of patients.
		Brought forward...	16,218	*Brought forward...*	10,517
Rosetta	1,020	Embaba	1,203	Akhmim	759
El Atf	9,444	El Saff	442	Girga	985
Teh el Barud	644	Beba	917	Baliana	394
Delingat	...	Sennures	221	Bassiun	80
Shubrakhit	524	Etsa	361	Nagh Hammadi	170
Baltim (Brollos)	536	Fashn	2,270	Deshna	141
Barrage	91	Beni Mazar	928	Kus	84
Belkas	310	Samallut	230	Tahta	49
Kafr el Sheikh	94	Abu Kurkas	540	El Kosseir	288
Fua	920	Wasta	150	Edfu	1,042
Santa	246	Deirut	355	El Derr	129
Quesna	600	Manfalut	620	Siwa Oasis	1,605
Tala	1,141	Abnub	213	Bahria Oasis	70
Menuf	276	Abu Tig	967	Dakhla Oasis	215
Ashmun	281	El Badari	720	Kharga Oasis	192
Manzala	91	Tima	380		
Carried over...	16,218	*Carried over...*	26,535	Total... ...	32,938

(iv) Pharmacies and Pharmacy Law.

The Pharmacy Law which came into operation at the end of 1904 involved the organization of a special Inspectorate for its administration; and the application of the law by the agency created has resulted in a very marked improvement in these establishments and their management. At the same time, the conditions under which the Pharmaceutical profession is practised appear to be marked by certain inadequacies. Of these, the most important, as pointed out by the Chief Inspector (Dr. Dinkler), are firstly the fact that nearly half of the pharmacies are owned and held by unqualified persons, though these latter comply literally with the law by employing one or more qualified pharmacists; secondly that a large degree of dispensing and sale of drugs takes place in so-called " clinics " (held by a certain class of medical practitioners), under the guise of prescribing and supplying medicines to their patients.

As regards the first condition, it is difficult to meet the argument commonly advanced that it is unreasonable and unjust to interfere with the freedom of any person in the investment of capital. If, however, it be shown that the ownership of pharmacies by unqualified persons involves danger to the public, then it would appear that a case is made out for taking measures of legislation to prevent such danger. And indeed it is alleged that in the presence of obstruction on the part of an unqualified owner it is difficult if not impossible for the qualified pharmacist of the establishment to insist on procuring good and reliable drugs.

As regards the second objection that the profession of pharmacy is illicitly carried on by certain medical men under the guise of prescribing for patients, this is a matter which does not appear to involve any special danger to the public, and is one which should therefore be preferably regulated by the corporate opinion and action of the medical profession rather than by the Government. It is possible to sympathize with the bona-fide pharmacists who see their livelihood endangered by considerable competition, but there is little reason to be advanced for affording State protection to any one given profession to the exclusion of others.

The following is an extract from the Report of Prof. Dinkler, Chief Inspector of Pharmacies :—

" According to the last Report there were in Egypt 300 pharmacies at the end of 1908 :—

164 belonging to qualified pharmacists, and

136 belonging to unqualified proprietors.

At the end of 1909 there were 319 pharmacies, showing thus an increase of 19. Of these:—

159 belonged to qualified pharmacists, and

160 belonged to unqualified proprietors.

They are divided as follows :—

	Cairo.	Alexandria.	Provinces.
Belonging to qualified pharmacists	70	36	53
„ „ unqualified „	60	30	70
Total	130	66	123

Comparing the figures for 1908, with regard to the number of qualified and unqualified proprietors, with those of 1909, those qualified show a diminution of 5, but the unqualified show an increase of 24.

Thus :—

	Cairo.		Alexandria.		Provinces.	
	1908	1909	1908	1909	1908	1908
Qualified pharmacists	70	70	35	36	59	53
Unqualified proprietors	48	60	27	30	61	70

During the last year 210 inspections were made, viz.:—

92 in Cairo (against 81 in 1908) ;

58 in Alexandria (against 42 in 1908) ;

60 in the provinces (against 80 in 1908).

The results of which are :—

	Cairo.	Alexandria.	Provinces.
Good or fairly good	75	42	43
Mediocre or bad	17	16	17

The latter are divided as follows :—

	Cairo.	Alexandria.	Provinces.
Qualified pharmacists	7	6	4
Unqualified proprietors	10	10	13

Showing thus twice as many "bad" inspections in connection with unqualified proprietors. This is so much more striking, as twenty more inspections have been made of qualified than of unqualified.

36 new authorizations for acting as pharmacists have been issued in 1909, the holders of which are :—

21 from Constantinople ;

9 from Beyrout (French School) ;

1 from Beyrout (American School) ;

3 from European Universities ;

1 from the United States of America.

The Kasr el Aini School did not deliver a single Diploma last year, and there are no students of this science there at present.

A new inspection form has been elaborated and taken into use ; this will serve to render all inspection uniform and also to enable the pharmacists clearly to understand the conditions required.

307 samples of drugs were bought during the year ; analysis showed that of these 232 samples were good and 75 samples bad.

In 20 samples of reputed Citrate of Magnesia, 2 only were found to be genuine, the other 18 samples were found to be Tartrate of Sodium.

The number of drug stores has increased from 130 to 133, 8 new ones were opened and 5 old ones closed.

Five new authorizations were granted for the sale of poisons. The total number of authorized poison sellers now amounts to 60.

Of 14 Aphrodisiac products bought from itinerant vendors, 10 showed on analysis that they were composed of Hashish, Sulphide of Arsenic, and Arsenious acid.

The importation of Opium is decreasing, and the culture of the poppy in the interior is increasing."

The supply of properly qualified pharmacists continues to remain much below the demand both for Governmental duty in hospitals and also in private establishments.

Proposed legislation is now before the Government, for the purpose of constituting a class of assistant pharmacists who after proof of experience and of moderate attainments, will under certain restrictions be admitted to dispensers' duties in the pharmacies.

The object of this measure is twofold, viz., to regulate the position under improved conditions of some considerable number of persons who are now and who have been for some time employed in pharmacies, and also to provide some supply to the increasing demand for reasonably qualified assistants.

In addition, an attempt has been made to re-establish a School of Pharmacy at Kasr el Aini, but although the initial pay of a pharmacist in this Department has been raised to the same level as that of Medical Officers, no pharmaceutical student has yet come forward. One of the reasons alleged for this failure to attract students is that the Secondary Education Certificate is required, and the course of instruction is longer and more exhaustive than those of Constantinople, Beyrout, Athens, and the American Schools. The consequence is that Egyptians and others graduate in these foreign schools rather than at Kasr el Aini. In this connection it is to be noted that of the 36 persons who obtained authorizations to practice during 1909 not one graduated at Kasr el Aini, all 36 obtaining their diplomas from abroad.

TABLE VIII.

Pharmacies Inspectorate.

Pharmacies in Egypt since the promulgation of the Decree of 1904 :—

1. Total number of pharmacies in Egypt :—

in	1905	258
	1906	288
	1907	292
	1908	300
	1909	319

2. Pharmacies belonging to :—

	Qualified pharmacists.		Unqualified proprietors.	
in 1905	130 i.e.	50·38 %	128 i.e.	49·62 %
1906	153 „	35·15 %	135 „	64·85 %
1907	160 „	55·55 %	132 „	44·45 %
1908	164 „	54·66 %	136 „	45·34 %
1909	159 „	49·84 %	160 „	50·16 %

3. Number of inspections made :—

		Qualified pharmacists.	Unqualified proprietors.
in	1905	156 i.e. 100 % + 20 % re-inspected.	135 i.e 100 % + 5,46 % re-inspected.
	1906	153 „ 100·50 %	135 „ 100 %
	1907	124 „ 77·50 %	130 „ 98·48 %
	1908	96 „ 58·53 %	107 „ 78·67 %
	1909	108 „ 67·93 %	102 „ 63·75 %

4. Inspections mediocre or bad :—

		Qualified pharmacists.	Unqualified proprietors.
in	1905	93 i.e. 59·61 %	99 i.e. 77·34 %
	1906	58 „ 37·90 %	41 „ 30·37 %
	1907	42 „ 33·87 %	45 „ 34·61 %
	1908	19 „ 19·79 %	22 „ 20·56 %
	1909	17 „ 15·74 %	33 „ 32·35 %

(v) Practice of Medicine and Authorizations.

The law on the practice of Medicine and the kindred professions dates from June 1891, and under it any person who can produce a diploma from any recognized School of Medicine and the usual certificates of respectability from Government or Consular authority can claim the right to practise his profession in this country.

The operation of this law has for long revealed certain of its defects, amongst which are (*a*) the absence of any provision for either administratively or judicially revoking the licence in the event of the holder being found guilty of malpraxis or of any other misdemeanour such as in other countries involves the revocation of the permit ; (*b*) the absence of a clear statement that the diploma must be one entitling the owner to unrestricted liberty to practise in the country of origin ; (*c*) the absence of any effective provision for penalties in the event of professional men neglecting to conform to the legal ordinances of the Government, such as notification of infectious diseases or of (criminally or otherwise) suspicious deaths, negligence or false declaration in certificates of death, etc. In this connection may be cited the case of a medical man who issued a certificate of the death of a person he had not seen where such person subsequently entirely recovered from his illness. The facts were reported by this Department to the legal authorities, but it appeared that the action of the medical practitioner in question did not come within the provisions of the existing law.

It is not difficult to realize to what serious consequences this unpunishable facility to give false certificates of death might lead.

In the notification of infectious disease the inadequacy of the law is fully apparent, and was particularly exemplified in a recent outbreak of small-pox in Cairo, when many easily recognizable cases were deliberately allowed to pass without notification by their medical attendants.

It seems clear therefore that some amendment of the law is desirable and it is hoped that means may be found in the near future to fortify the provisions under which medical practice is regulated in this country. It may be that a potent factor in aiding the Government is to be found in the Medical Societies of Cairo and Alexandria which, if developed along strong and independent lines, may become of considerable assistance to the

Government, and fulfil the very useful and honourable rôle of intermediary between the Government and the great body of practitioners.

The number of authorizations to practise issued during the last three years were as follows :—

	1907	1908	1909
Medical	138	89	89
Pharmacy	44	40	36
Dental	5	5	3
Veterinary	8	8	4
Midwives	13	19	20

(vi) Medical Education.

Some modifications have been recently made in the curriculum of the Medical School of Kasr el Aini. These modifications have provided for better arrangement in the teaching of the preliminary sciences, for a larger degree of practical as opposed to theoretical instruction, and for the special recognition of ophthalmic surgery as an important subject. The latter step is intended to encourage a branch of study which has been emphasized by the recent development of the Ophthalmic Service, and to increase facilities for obtaining willing recruits for the personnel of this Service, a branch of practice which strangely enough is by no means as yet popular with young members of the profession.

Turning to medical education as a whole, there is no doubt that the subjects are well and comprehensively taught, and it is clear that the present course of instruction could not be readily improved upon, having regard to the anxiety of those who embrace it to be placed as soon as possible in a position enabling them to earn a livelihood. It is to be noted that the course is already longer than that of the Engineering and Law Schools. It is also essential to insist for the present on the fact that few Egyptian students adopt medicine purely as a branch of scientific study and thought, and that with a few remarkable exceptions they are inspired with the idea of acquiring a stock-in-trade of knowledge which will enable them as quickly as possible to earn a livelihood or make a fortune ; it is this attitude in which they approach their medical education and subsequent career.

It is largely for these reasons that it has not been found desirable to insist on a routine system of specialized study which has been advocated by some influential Egyptians, and also because at the present moment, ample opportunities exist to enable any specially studious or accomplished Medical Officer to emerge from mediocrity and satisfy his legitimate ambition.

It must not be forgotten that Kasr el Aini is the only source in Egypt from which a supply of medical men is to be obtained—a supply already too scanty for the needs of the country—and any scheme formulated to insist on specialized study for all students would certainly incur the risk of diminishing the supply of candidates.

The rôle of the Medical School should on the contrary be primarily to give a sound, well-balanced and comprehensive medical education to as many students as are needed for the medical services (governmental and otherwise) of the country. This is indeed the

governing factor, and for this purpose a certain number of soundly educated students of a moderate degree of attainments is the first requirement ; when this requirement is fulfilled, specialized study can come in as an accessory and be dealt with as circumstances suggest and permit.

As was aptly said by Dr. Holme-Grand at the Paris Medical Congress of 1907 : " Les Facultés de Médecine ne doivent pas avoir comme but principal de faire des agrégés, des professeurs d'élite, *mais de procurer à la grande majorité des étudiants* qui ne seraient ni des maîtres, ni des professeurs, mais des praticiens utiles et instruits, *les moyens de bien apprendre leur métier.*" Again, by Dr. Gouffler : " Demandons aux Facultés de faire non des savants, mais des praticiens," and by the Association Corporative : " L'objectif essentiel capital de l'enseignement dans les Facultés doit être la formation de médecins rompus aux difficultés de la pratique."

Efforts therefore to educate, to interest and to develop to a high degree the faculties of intelligent Egyptians on these lines are likely to have a profitable result, and for the present it will be well to limit the higher training in medical and cognate subjects to these more practical ends.

For these reasons it is considered wise to deprecate for the present any studied course which aims at specialization ; a line which most decidedly belongs to the few and not the many. As progress is made and intelligent ambition widens, it may be possible to bring more specialized branches and the more highly evolved sciences into an advanced programme of education ; but the time is not yet, and caution must be exercized if only to avoid the disappointment that certainly awaits premature efforts in that direction. However that may be, it is meanwhile certain that the Department possesses in some of the Medical Officers of its hospitals very promising material, creditable alike to the training they have received, and to their own energy and interest in their profession.

Intimately connected with the medical education of the student is also the question of the formation of those who are to teach. This question primarily concerns the Ministry of Education, but it may be said here that in the higher branches of medical instruction it is essential in the first place that the teacher shall have a fair practical knowledge of his subject, and in order that he may devote his knowledge to teaching rather than to practice, the function of teaching must be made as attractive as practice; in other words, if individuals will not follow the calling for its pure scientific value, it must be made as lucrative to him as could be his practice, and herein lies a problem of which the solution must be primarily a financial one.

B.—SPECIAL DEPARTMENTS.

(i) Lunatic Asylum. *

Abbassia.—The programme laid down two years ago for the extension and re-constitution of the Abbassia Asylum has been continued during the year, by the addition of a ten-bed block for first and second class female patients, and a section for 60 males.

* A further and more detailed report by the Director of the Asylum has recently been published.

The accommodation has been raised from 877 beds to 947, while another block of 60 single rooms now in course of construction should be completed in April * next, thus raising the number of beds to 1,007.

The number of inmates on December 31st, 1909, was 1,150, an excess of 203 over the calculated provision, thus shewing overcrowding to the extent of 21·4 %, a condition which, however, is unavoidable in view of the impossibility of refusing admission to dangerous lunatics or of discharging such persons uncured.

Khanka.—The first portion of the new Asylum now under construction at Khanka has made progress during the past year, and the actual masonry work of all buildings is completed. There remains plastering, wood-work, and fittings, drainage and lighting and water installations to be added, the roads and tramways to be made, and certain enclosures to be completed. The first portion will then (probably in March 1911 be able to accommodate 240 patients. (Reference to its future extension is made later on in this Note).

Lunacy administration.—Dr. Warnock, basing himself on the average admissions and discharges for the last few years, calculates that the Abbassia Asylum will be called upon to shelter some 1,275 lunatics at the end of 1910, while provision will have to be found for 1,400 at the end of 1911. Of these it is expected that the completion of the first portion at Khanka will provide for 240, thus leaving 1,160 to be accommodated at Abbassia. For this purpose the remainder of the programme, adding 143 beds, should be completed as soon as possible. It may be noted that 75 criminal lunatics, now housed at Tura Prison, are due to return to Abbassia when Khanka is ready for occupation.

Dr. Warnock further considers gradual extension of Khanka will then have to take place at the rate of 150 beds yearly, until a total accommodation for 1,000 inmates is provided for by the end of 1915, and if in the course of the next two years the additional 143 beds are provided at Abbassia, the total accommodation will then be 2,150, which so far as careful calculations can go, should suffice for the needs of the country as regards accommodation for the most unmanageable and dangerous insane.

The Census Returns estimate the insane of the country at 5,447, and in view of the above calculation, it is necessary to say that this figure cannot be regarded as an indication of the real prevalence of lunacy. In the first place, it is probably very much under-estimated, for the reason that persons do not readily admit either themselves or their relatives to be insane; and in the second place, those that would be declared to the enumerator are usually half-witted persons (Arabic " abeet ") who exist in every village, and who are carefully distinguished from the real lunatic (" magnoon ") whose manifestation of his malady may be spasmodic and uncertain. The official census figure of 5,447 cannot therefore be regarded as throwing much light on the probable accommodation required in the near future.

The total admissions of insane were 546, of which number the highest proportion was due to pellagra (101), the next highest (43) being due to Hashish, a somewhat higher rate than that of last year (which was 36).

A definite beginning was made in 1908 of the investigation of pellagra, and a preliminary report was presented by Dr. White ; this report will be found at page 103.

A Pellagra Committee has recently been formed in London to arrange for the investigation of this very interesting disease, one which is said to cause some 20 % of the lunacy

* This block has now (June) been completed.

in Egypt, and the Committee has nominated Dr. Sambon as its representative to carry on the enquiry.

In the instructions to Dr. White it was stated that attention should be paid to the clear possibility that this disease was caused by a blood parasite rather than by the ingestion of toxic substances derived from badly preserved maize. According to information available the London Committee now proposes to move on the same lines. There seems little doubt that there is a connection between maize diet, and the incidence of pellagra ; whether the connection is of a causative or of a contributory nature remains to be proved ; it is conceivable that the maize toxin may induce a constitutional condition lowering the natural vital resistance, and so render the individual vulnerable to the attacks of a parasite.

A question, in relation to the detention of lunatics which requires attention, is that of the position of certain " interdicts " ; i.e., persons who being insane are declared by the Courts (Meglis el Hasby) incapable of administering their property, to which accordingly an official administrator is appointed. These interdicts are usually persons of property, and when, as is commonly the case, their estates are able to afford it, they are entitled to maintenance in a superior class, which is only accorded on a certain (moderate) payment. It frequently happens that by oversight or design the periodical payments are not made. and thereby the insane interdict is relegated to the unpaying category, to his own misfortune, but to the advantage of the estate by which the relatives benefit.

Dr. Warnock has been instructed to report such cases to the Ministry of Justice, which forwards the notice to the Meglis el Hasby concerned.

In a Note of last year reference was made to the desirability of some legal enactment on the wide subject of lunacy in this country. This is constantly being pressed by Dr. Warnock, and it was then pointed out that the present action of the Department in lunacy matters is not based on any existing law, but rather on the natural and implicit right of a Government to take measures in the interest of public security ; at the same time it is readily conceivable that without laws and regulations, especially in a country where extra-territorial rights meet one so persistently, the Director of an Asylum which is inadequate to fulfil the needs of the country must frequently find himself in positions of dilemma where it is not easy at first sight to decide between the conflicting interests of individuals and of the public, of the Government of the country and the consular prerogatives. It is therefore not a little to the credit of the Asylum authorities that though a minimum number of those discharged or to whom admission has been refused have subsequently committed breaches of the peace no " incident " of any importance has arisen within the period covered by the writer's personal knowledge.

Meanwhile, it has been suggested to Dr. Warnock to take the preliminary stop of drawing up a short scheme of routine procedure and regulations, which after receiving the adhesion of the Departments concerned, may be put into tentative operation, and subsequently form the basis on which a lunacy code may be constructed.

Dr. Warnock drew up a Note in accordance with the suggestion above referred to, but it has not yet been possible to put into operation the majority of the proposals contained therein.

Meanwhile the position of the Lunacy Authorities is somewhat difficult ; on the one hand they risk the chance of a civil action for the wrongful incarceration of an individual on a certificate which is not legalized, and on the other, of refusing admission to an illegally certified lunatic, who may, if not confined, immediately commit some violent crime.

The Department is now engaged in drafting the lines of a simplified lunacy law, which, it is hoped, may at least afford a certain degree of legality and authorized procedure in a very difficult branch of administration.

TABLE IX.

GOVERNMENT HOSPITAL FOR THE INSANE, ABBASSIA, CAIRO.

CASES.		1908	1909
Existing	Males	655	741
	Females	241	276
	Total	896	1,017
Admissions, once or more	Males	454	431
	Females	139	147
	Total	593	578
Discharged	Males	293	264
	Females	75	73
	Total	365	337
Died	Males	78	76
	Females	29	32
	Total	107	108
Remaining	Males	741	832
	Females	276	318
	Total	1,017	1,150
Admitted more than once during the same year	Total	18	18
Cases found not to be insane	Total	14	15 *
Number of re-admissions of patients discharged in previous years	Males	92	94
	Females	29	18
	Total	121	112

* 15 (or 14 patients, one being admitted twice in 1909).

TABLE X.

GOVERNMENT HOSPITAL FOR THE INSANE, ABBASSIA (CAIRO), ADMISSIONS.

PATIENTS COMING FROM		1908	1909
Governorates	Cairo	218	226
	Alexandria	59	46
	Suez	15	11
	Port Said and Canal	19	9
Mudirias Lower Egypt	Kaliubia	26	22
	Sharkia	42	40
	Gharbia	43	53
	Dakahlia	11	23
	Menufia	27	23
	Behera	4	12
Mudirias Upper Egypt	Giza	12	9
	Fayum	7	4
	Beni Suef	8	7
	Minia	18	11
	Assiut	12	28
	Girga	18	11
	Kena	7	7
	Aswan	5	2
Sudan		2	2
Syria		...	...
Armenia		...	...
	Total	561	546
	GRAND TOTAL*	593	578

* Including: (*a*) Admitted more than once during the same year : 1908, 18 ; 1909, 18.
(*b*) Cases found not to be insane : 1908, 14 ; 1909, 14.

(ii) Ophthalmic Section.

The movement set on foot by the benefaction of Sir Ernest Cassel and the enterprise of the late Director-General of this Department has now settled down into a well defined policy which expresses itself in work along three separate lines :—

1. Of these, the first is that of travelling tent hospitals, and as the establishment is a fixed one based on the experience of some years, and the routine precisely the same from year to year, the work done is merely a measure of the activity of the staff, and of the willingness of the people to avail themselves of the surgical aid put at their disposal.

The two tent hospitals have visited during the year 1909 the four towns of Mansura, Giza, Beni Suef and Luxor. The total number of working days has been 442, of which 284 fall to the credit of No. 2 Hospital, and 158 to that of No. 1 Hospital, which was for some months in the summer immobilized for " leave " purposes.

The number of new patients dealt with has been 7,096, and the total number of visits has been 100,084, giving an average of 221 per working day in each hospital.

No. 1 Hospital (Giza and Luxor) has averaged 17·5 new patients per day, with an average visit of 253 daily.

Mr. MacCallan's latest report from Luxor states that the visits then (February 14th) average 350 per diem.

No. 2 Hospital (Mansura and Beni Suef) has averaged 15 new patients daily and a daily visit of 211.

A noteworthy point in connection with this work is the fact that (as Mr. MacCallan reports), rather more than one-third of the persons attending for treatment are under the age of 15.

" This large increase " he states, " in the number of children treated, is very encouraging ..... Every Fellah desires the kind of treatment he gets at the Ophthalmic Hospital, and will submit to it, if it can be brought comparatively close to his door."

To get at the young is one of the greatest difficulties surmounted. There is hope, therefore, that if the travelling service can be sufficiently developed (and for this both men and money is needed) a real and practical result may be obtained amongst even the enormous mass of ophthalmic inefficiency that is so prevalent amongst the peasantry of this country.

2. The second line of action is concerned with permanent hospitals, and their work in the big centres of population. The completion of the Ophthalmic Hospital at Tanta referred to in last year's Report has enabled this institution to put in some good work.

Mr. MacCallan considers that the more favourable circumstances under which work is done in stationary hospitals contributes largely to its degree of success and its sphere of utility, but this opinion must in no way detract from the educational and familiarizing value of the Travelling Tent Hospitals.

Tanta Hospital dealt last year with 4,996 new cases, and more than 77,000 visits were made to the hospital by patients under treatment in the year. 1,763 major operations were performed, and 2,418 minor ones in the same period at this hospital.

The hospital at Assiut, partially subscribed for by the inhabitants of that town, is nearly completed, and will be opened during the year.

The Mansura Hospital, which is practically the gift of Bedrawi Bey, who has given L.E. 5,000 for the purpose of building it, is now about to be commenced.

3. The third line of action is that which applies to dealing with eye disease in the Government schools, and is one which by reason of its bearing on the efficiency of the rising generation must be considered as most important. At the present time work has been carried on at the Tanta School for two years with good result, and it is hoped to establish this branch of useful work in the schools at Assiut and Galiub as a further extension of the system, as soon as the necessary credits can be obtained.

An additional development of this line of action is to be found in the instruction of teachers, and by them of the student, of some simple rules of hygiene. A tentative proposal has been made to the Ministry of Education, but no practical result has yet been obtained. It is proposed that a small Committee, composed of the Medical Officers of the Ministry of Education and representatives of this Department, should meet to consider the question and institute proposals for laying before the Ministry a scheme of continued instruction in the main essentials of hygiene. It is believed that by this means the best chance would be afforded of inducing a higher standard of cleanliness and healthy habits amongst the rising generation of all classes.

TABLE XI.

Ophthalmic Hospitals.

	Year.	
	1908	1909
Hospitals in existence:—		
1. Travelling	2	2
2. Permanent	1 (*a*)	1
New patients treated	7,794	12,092
Total attendances	132,278	177,761
Operations performed	6,426	9,930
Details of 1908-1909:—		
Total number of patients examined	19,614	22,373
Patients regulary treated	7,794	12,092
Various Details:—		
Incurable cases	4,550	2,302
Trichiasis examined	8,159	10,060
„ operated and cured	2,262	3,128
Blind monocular	1,189 (*b*)	2,116 (*c*)
„ binocular	852 (*d*)	1,385 (*e*)
Total	2,041	3,501 (*f*)
New patients treated per age:—		
Under 1 year	247	516
from 1 to 5 years	585	1,645
„ 6 „ 10 „	902	1,442
„ 11 „ 16 „	849	1,294
„ 16 „ 20 „	829	1,156
„ 21 „ 40 „	2,584	3,775
„ 41 and over	1,798	2,206
Total	7,794	12,092

(*a*) Tanta permanent Hospital was opened November 21st, 1908.
(*b*) 6·06 % of cases examined
(*c*) 4·34 % „ „
(*d*) 9·45 % of cases examined
(*e*) 6·19 % „ „
(*f*) 16·64 % „ „

Patients treated 200
Operations performed during 1908 ... 515

TABLE XII.

WORK DONE AT THE OPHTHALMIC HOSPITALS DURING 1909.

	TOTAL	PERMANENT	NO. 2 TRAVELLING.		NO. 1 TRAVELLING.	
		Tanta.	Mansura.	Beni Suef.	Giza.	Luxor.
1. In-patients ... ... (No. of available beds, 28)	390	262	59	59	24	26
2. Operations	9,930	4,181	2,745	758	1,536	710
i. Major :—						
(*a*) Senile cataract	106	46	28	7	10	15
(*b*) Soft cataract	86	63	6	7	10	...
(*c*) Trichiasis	3,128	1,295	1,094	121	475	143
(*d*) Other operations	1,094	359	234	92	332	77
ii. Minor :—						
(*a*) Scraping lids of Trachoma patients.	3,986	1,739	787	504	591	365
(*b*) Other operations	1,741	679	596	27	332	110
3. Out-patients :—						
i. Incurable	1,026	161	315	175	186	185
ii. Postponed... ... ... (of these, 2,787 are reckoned more than once, having been postponed on more than one occasion).	10,170	4,354	1,976	740	1,975	1,125
iii. Tickets issued, i.e., New cases	12,092	4,996	3,120	1,191	1,783	1,002
iv. Old cases	154,473	68,162	42,103	18,441	23,519	10,248
v. Visits made by patients to hospital for treatment	177,761	77,677	47,514	12,547	27,463	12,560
vi. Average number of visits made to hospital by each patient under regular treatment	1	15	15	11·6	16·46	12·8
vii. Discharges :—						
(*a*) Cured	887	346	270	28	228	15
(*b*) Relieved	681	157	307	10	195	12
(*c*) Incurables	280	433	318	207	118	204
(*d*) Spontaneously ceased to attend after having attended only once ...	971	684	205	...	82	...
(*e*) Spontaneously ceased to attend after having attended more than once...	6,488	3,413	2,330	...	745	...
viii. Trichiasis cases seen among new out-patients :—	10,060	4,299	2,814	616	1,914	417
(*a*) No previous operation having been performed (of these, 3,037 are reckoned more than once having been postponed previously)... ...	8,470	3,368	2,486	485	1,818	313
(*b*) Previous operation performed :—						
1. Successfully ... ... (of these, 12 are reckoned more than once, having been postponed previously).	109	16	43	28	22	..
2. Unsuccessfully ... ... (not at an Ophthalmic hospital, but probably by some charlatan: of these, 217 are reckoned more than once, having been postponed previously).	1,481	915	285	103	74	104
xi. Ophthalmoscope and Refraction cases...	1,153	161	300	86	338	168
x. General anæsthetics	2,783	1,226	666	392	456	143

TABLE XII—*continued.*

xi. Towns in which Hospital situated :—

	Applications for treatment.	Treated.
Tanta	9,515	4,794
Mansura	5,411	3,192
Beni Suef	2,106	1,428
Giza	3,944	1,709
Luxor	2,212	969
Total	23,288	12,092

xii. Ages of patients examined :—

	Camp or Hospital at					
	Tanta.	Mansura.	Beni Suef.	Giza.	Luxor.	Total.
(*a*) Under one year	269	137	59	30	21	516
(*b*) From 1 to 5 years	653	246	430	183	133	1,645
(*c*) From 5 to 10 years	548	436	123	185	150	1,442
(*d*) From 10 to 15 years	466	350	191	197	90	1,294
(*e*) From 15 to 20 years	521	257	106	200	72	1,156
(*f*) From 20 to 40 years	1,638	1,132	315	436	252	3,773
(*g*) Over 40 years	699	634	204	478	251	2,266
						12,092

xiii. Origin of patients :—

	Camp or Hospital at					
	Tanta.	Mansura.	Beni Suef.	Giza.	Luxor.	Total.
Patients from town in which hospital is situated	2,155	1,064	686	466	358	4,729
Patients from Markaz in which hospital is situated	1,159	1,233	386	873	445	4,096
Patients from other Markazes	1,592	974	99	414	188	3,267
						12,902

xiv. Hospitals at work at the following places during the following periods :—

Upper Egypt	(*a*) Giza	January 1st	to May 27th.
	(*b*) Beni Suef ...	November 1st	to December 31st.
	(*c*) Luxor	November 13th	to December 31st.
Lower Egypt	(*a*) Tanta	January 1st	to December 31st.
	(*b*) Mansura ...	January 1st	to October 30th.

	Camp or Hospital at					
	Tanta.	Mansura.	Beni Suef.	Giza.	Luxor.	Total.
No. of full days work	302	236	48	120	38	744
No. of half days, i.e., Government holidays (Fridays not counted)	11	6	4	6	4	31

Blindness.

	Total No. of patients examinated.	(*a*) Monocular		(*b*) Binocular		Total (*a*) and (*b*)	
		No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.
Tanta	9,515	762	8	550	5·7	1,312	13·7
Mansura	5,411	492	9·09	264	4·87	756	13·97
Beni Suef	1,191	263	22·08	173	14·52	436	36·3
Giza	3,944	338	8·569	213	5·4	551	13·97
Luxor	2,312	261	11·28	185	8	446	19·29
Total	22,373	2,116	9·45	1,385	6·19	3,501	15·64

xv. Average number of patients seen per day, 221.

(iii) Medico-legal Reports.

The confection of Medico-legal reports in the interests of justice still forms a very large proportion of the work of District Medical Officers.

They are required by law in every case of personal injury, whether the result of accident or assault, to make a report. As originally in accordance with legal provision, *full* reports (with three copies) had to be written by the Medical Officers such work monopolized an utterly unjustified portion of their time.

Recent efforts have been made, by the introduction of short notes in a carbon-copy book for use in slight cases, to minimise waste of time and effort. Some reduction in this direction has taken place; but a further step to the desired end of accepting simple reports in *all* accidental cases is necessary before the position can be regarded as satisfactory.

The statistics for the past year are as follows :—

TABLE XIII.

Medico-legal Reports.

Slight cases	Accidental	5,409
	Criminal	26,233
Severe cases	Accidental	5,996
	Criminal	3,483

(iv) Medical Commissions.

The Medical Commission of Cairo, which is an institution of long standing, established for the purpose of examining persons desirous of entering Government Service and of dealing with claims for sick-leave, invaliding and pensions, has recently been supplemented by the creation of similar Medical Boards in London and Paris.

No statistics regarding the work of these Boards are at present available, but the figures of the Cairo Commission are given below and sufficiently indicate the mass of work which has to be performed by this body. It seems probable that if the recent increase continues to be maintained it will be necessary to reconsider its position and constitution.

TABLE

STATISTICAL RETURN OF THE EMPLOYÉS.

MINISTRIES AND ADMINISTRATIONS.	FIT.				UNFIT.			
	At examination by Commission.	Vide certificate approved.	"Maladie légère"		Vision.	Other diseases.	Post-poned.	Standing cases of vision up to Dec. 1909.
			Vision.	Other diseases.				
Ministry of Interior	93	...	2	...	38	4	1	6
Public Health Department...	50	...	3	...	3	1	1	3
Prisons Department	3	...	...	...	1	...	...	1
Slave Trade Department	3	...	1	...	...	...	1	1
Ministry of Finance	67	...	3	...	10	2	9	6
Survey Department	9	...	...	...	4	...	2	2
Coast Guards...	11	...	1	...	2	...	1	1
Ports and Lighthouses...	...	...	...	...	...	1	...	...
Public Debt Department	1	...	...	...	...	...	...	...
Custom Houses	1	...	...	...	2	...	...	...
Public Works Ministry	51	...	1	...	2	5	1	5
War Office	35	...	1	...	4	1	4	4
Ministry of Foreign Affairs	1	...	...	...	...	...	...	...
Ministry of Justice	57	...	2	1	8	5	5	5
Courts	2	...	...	2	...	...	...	...
Mixed Tribunals	18	...	1	0	1	...	2	...
Ministry of Education...	89	5	2	...	5	6	2	6
Postal Administration...	63	...	...	...	7	...	3	5
Railways „	154	...	3	...	19	3	6	17
Telegraphs „	19	...	...	...	1	...	2	7
Wakfs „	51	...	4	...	8	1	3	11
Menufia Mudiria	...	...	...	...	...	...	...	...
Gharbia „	...	...	...	...	...	...	...	...
Dakahlia „	...	...	...	...	...	...	...	...
Behera „	...	...	...	...	...	...	...	...
Sharkia „	...	...	...	...	...	...	...	...
Giza „	...	...	...	...	...	...	...	...
Beni Suef „	...	...	...	...	...	...	...	...
Fayum „	...	...	...	...	...	...	...	...
Minia „	...	...	...	...	...	...	...	...
Assiut „	...	...	...	...	...	...	...	...
Governorate Cairo	1	...	...	...	...	...	...	...
Alexandria Municipality	...	...	...	...	...	...	...	...
Quarantine Board...	...	...	...	...	...	...	...	...
Legislative Council	5	...	...	...	...	...	1	...
Council of Ministers	1	...	...	...	...	...	...	...
Contentieux	2	...	...	...	...	...	...	...
National Printing Office	...	...	...	...	...	...	...	...
Sudan Government	...	...	...	...	...	...	...	...
TOTAL...	787	5	24	3	115	29	44	80

XIV.

MEDICAL COMMISSION, 1909.

PENSIONS.					LEAVES.					HEIRS.				EMPLOYEES	TOTAL.
Unfit vide certificate approved.	Unfit examined by Commission.	Grand Mal.	Petit Mal.	Found fit for duty.	Granted, vide certificate approved.	Granted after examination by Commission.	Refused.	Age.	Expert opinion taken.	Able to obtain livelihood.	Unable to obtain livelihood.	Age.	Recommended for pension for sometime and re-examination.	Sent to hospital for treatment, observation and report.	
20	74	7	...	77	74	78	14	15	3	1	...	...	..	4	511
...	7	4	...	2	104	28	2	5	...	...	...	...	...	...	213
...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	7
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6
3	42	7	...	5	52	40	8	36	...	1	2	...	2	...	295
...	5	...	...	1	17	9	2	2	2	...	...	...	...	...	55
...	1	...	...	1	1	1	...	...	...	...	...	...	...	...	20
...	...	...	...	...	1	1	...	...	...	...	...	...	...	1	4
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
...	...	1	...	...	1	1	...	...	...	...	...	...	...	...	6
2	15	1	1	...	26	20	3	13	2	...	...	...	...	...	148
...	5	2	...	2	...	...	...	22	...	...	...	...	...	...	80
...	1	1	...	...	...	...	...	10	...	...	...	...	...	...	13
3	7	6	...	2	19	34	2	9	...	...	...	...	...	...	165
...	1	...	...	...	14	3	...	16	1	...	...	1	...	...	40
2	4	...	...	...	...	...	...	...	...	...	...	...	...	...	28
...	10	...	...	1	109	14	2	2	...	...	...	...	...	...	253
1	11	3	...	5	1	13	2	6	...	...	...	4	...	...	124
...	27	6	...	5	1	1	...	5	2	...	...	...	...	2	251
...	1	1	...	...	1	...	...	1	...	...	...	...	...	...	33
...	12	4	1	5	1	1	...	3	...	...	...	...	...	...	105
...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1
...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	3
...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	3
...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	2
...	...	...	...	...	3	2	...	...	...	...	...	...	...	...	5
...	...	...	...	...	15	9	1	1	...	...	...	...	...	...	26
...	...	...	...	...	5	...	1	...	...	...	...	...	...	...	6
...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1
...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	4
...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1
...	3	...	...	...	3	5	...	6	...	10	5	1	...	2	36
...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	8
...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	2
...	...	1	...	...	1	1	..	...	...	...	...	...	...	...	5
...	16	...	...	...	3	1	1	3	...	1	...	...	...	...	25
...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1
32	243	44	2	106	469	263	39	157	10	13	7	6	2	9	2,489

(v) General Stores.

The "Stores" division of the Department is one of the most important, for it is this office which has to obtain and issue all the furniture, ward equipment, clothing, instruments, drugs, dressings and materials for the General and Infectious Hospitals, the Lunatic Asylum, Ophthalmic Hospitals, and the temporary ambulances (Tent Hospitals) sent out on emergency (in 1909 no fewer than 110 were despatched with accommodation for 1,524 beds); it furnishes the dispensaries throughout the country; equips the disinfection service as well as the special establishments, such as the Hygienic, the Vaccine, the Antirabic, and the Serum Institutes; it supplies forage for the animals of the Department (650 in number); it makes contracts far all large supplies (to the amount of L.E. 62,819 in 1909), and, finally, provides the materials required by the Engineering Section for such buildings and repairs as are carried out "en régie." The total average value of material passing annually through the office is approximately L.E. 80,000.

The adjudications made during the year amounted to L.E. 62,817, of which the most important were :—

	L. E.
Rations...	31,491
Forage for Scavenging and Watering Service...	2,308
Purchase of Cyprus bulls for Serum Institute...	2,017
Equipment, bottles, etc.	7,900
Meat	3,384
Drugs	4,777
Flour	4,308
Forage for Serum Institute	3,200
Coal	2,630
Soap	804

No adjudication for disinfectants or their components was made in 1909 since sufficient resources had already been provided during the preparation for cholera in 1907–1908.

An improvement has recently been effected by the formation of a separate "Epidemic" Store apart from the general Equipment and Drug Stores. In the Epidemic Stores the necessary material for tent hospitals and disinfection gangs are kept ready packed in units so that the required equipment can be despatched immediately on the receipt of telegraphic instructions.

The following table shows the various sections of the Stores, the number of the various categories of articles kept in each section, and the estimated value of such materials as are now in store.

Section.	Categories of articles. *	Value of existing material. *
	Number	L.E.
1. Equipment Stores	900	13,000
2. Drug and Medicine Store	800	8,000
3. Surgical Instruments	480	2,000
4. Epidemic Store	700	5,000
5. Transport Section	Vehicles, animals and harness, etc.	
Total	2,880	30,000

* Approximative round numbers.

In addition to these Stores there are :—

An establishment for the wholesale manufacture of tinctures, liniments, syrups, etc., of which more than 264,277 bottles have been turned out in 1909, as well as 16,045 kilogrammes of ointments, etc.

A tailor's shop for the making of hospital clothing, bedding, etc.

A tent makers shop for the making and repairing of tent equipment.

Instruments maker's shop, blacksmith's and plumber's shops, and a painter's and polisher's shop and store.

A carpenter's shop in which hospital and office furniture was made has had to be removed owing to want of room, and these articles are now supplied by outside traders on adjudication.

The greater part of the very large amount of disinfectants used by the Department has now to be manufactured in the open air, a situation which constitutes an inconvenience and a detriment to the amenities of the surrounding grounds.

It has long been apparent that considerably more room and buildings were required. Plans have been drawn up, and a first instalment of the very necessary improvements was completed at the end of 1909.

It is hoped that a further stage may be achieved in 1911.

The fire prevention installation appeared to be insufficient, and in consequence expert advice was obtained, and an improved scheme has been installed.

Having regard to the considerable growth of the Stores Establishments, and circumstances of pressure under which this growth has taken place, a departmental Committee was appointed in October 1908, in order to consider the organization and disposition of the Stores, and allied services, with a view of formulating recommendations for the consolidation and better organization of the work involved.

Shortly afterwards, a general examination of the Departmental Stores and accounts was made by Mr. Middleton, Inspector-General of Accounts at the Ministry of Finance, and consequently it is proposed to await action on the report of the departmental Committee until the recommendations can be considered and if possible consolidated with those of Mr. Middleton.

PART II.—PUBLIC HEALTH.

A.—GENERAL CONSIDERATIONS.

(i) The Census.

The importance of the census in matters of public health is obvious, for all vital or infectious disease statistics are necessarily based thereon.

In the intervals between the years of census-taking the population of centres is estimated according to recognized formula based on the births and death-rate. This method can of course take no account of emigration or immigration, and thereby a source of fallacy is immediately introduced which it is difficult to correct in the absence of machinery for registering the shifting of population.

The following table (XV) indicates the variation between the actual census figures and the figures of estimation, a variation which goes far to explain the difficulty of producing in this country vital statistics which shall be fairly reliable.

TABLE XV.

Showing the difference in the Census figures for 1st June 1897 and 30th April 1907 in the twenty principal towns of Egypt (Egyptians and Foreigners).

	Census 1897.	Difference between census of 1897 and 1907.	Census 1907.	Calculated population up to 30th April 1907.
Cairo	568,934	+ 85,542	654,476	709,379
Alexandria	319,766	+ 50,243	370,009	381,658
Damietta	31,515	— 2,161	29,354	29,874
Tanta	57,289	— 2,852	54,437	72,765
Mansura	36,131	+ 4,148	40,279	42,172
Damanhur	32,202	+ 6,794	38,996	38,020
Zagazig	36,465	— 1,466	34,999	47,411
Shibin el Kom	20,705	+ 871	21,576	23,634
Giza	16,877	— 390	16,487	20,471
Benha	9,189	+ 5,993	15,182	9,738
Port Said	42,328	+ 7,556	49,884	61,626
Suez	17,404	+ 943	18,347	20,699
Ismailia	7,207	+ 3,166	10,373	10,894
Fayum	33,069	+ 4,251	37,320	36,675
Beni Suef	16,751	+ 6,606	23,357	21,042
Minia	23,141	+ 4,249	27,390	27,083
Assiut	42,078	— 2,636	39,442	48,983
Sohag	14,512	+ 3,002	17,514	16,349
Kena	27,478	— 7,409	20,069	34,067
Aswan	13,882	— 1,264	12,618	18,787
	1,366,923	165,186	1,533,109	1,671,327
		+ 183,364		
		— 18,178		

(ii) Registration of Births and Deaths.

The existing law on this subject is somewhat inadequate, but certain amendments are now under the consideration of the Legislative Council and it is hoped that the improvements to be effected will provide the necessary legal sanction for improved registration.

The machinery, however, for putting into operation any provisions of the law is markedly defective. In the towns where medical officers reside, and in some of the larger villages in touch with the more civilized areas, registration is fairly well carried out, but in the greater part of the country—especially in Upper Egypt— it is very defective.

It is a common occurrence for the births of female children not to be registered at all; not infrequently if a male child dies and another is born soon afterwards the second child is given the name of the dead one, and no second registration is effected.

The births of European children are registered—if registered at all—at their respective Consulates, and these registrations may or may not be communicated to the Government authority. The bearing of these facts on the question of vaccination and the prevalence of small-pox is obvious.

As regards death registration the Department is seldom without an outbreak of infectious disease in hand which is traceable to neglected death registration and the resulting failure to effect the required communication to the local health authority.

Infectious disease (of all kinds) is for the present one of the most important problems with which this Department has to deal, and the first essential for a satisfactory issue is the procuring of early information not only of preventible disease but also of variation in the death-rate.

During a somewhat exhaustive examination of the registers, which was recently made in Upper Egypt, the Inspector charged with this duty found that in the great majority of villages the deaths registered showed a fictitious mortality of 15, 10, or even 8 per thousand when it was known that it should have been at least 35 or perhaps 40 per thousand—a fact which indicates that from half to three-fourths of the deaths were not inserted in the registers.

One of the chief reasons for these shortcomings is that in practice there is no single person responsible for the carrying out of the service; the actual registration is presumed to be performed voluntarily by the Sarraf (tax-gatherer) of the village. This individual is an employee of the Ministry of Finance, he is commonly charged with a district embracing several villages or ezbehs, and when the question is raised of irregularities of registration in the case of any particular village, the excuse of absence is commonly made; further, the man in question has no first knowledge of the facts which he is supposed to register, but depends on the Omda, who in turn shelters his responsibility behind that of the village barber, added to which the fact that the Sarraf is not paid for his service and that he is the servant of another Ministry, makes it clear that no great degree of efficiency in registration can be expected.

If the present scheme of the Department for developing an improved corps of village barbers or sanitary agents becomes an accomplished fact, it is believed that much of the evil of inefficient registration may be corrected; this will naturally be a work of time, but it is by no means beyond the bounds of practical politics.

Arab registration.—Apart from the difficulty of obtaining efficient registration amongst the fellaheen (agricultural dwellers in Egypt), the question becomes considerably complicated by the immunity claimed by the Bedwin (pastoral dwellers in the desert borders) against the common law of the country. Captain Thomson, who was recently charged with a mission amongst these people, reports as follows :—

" It is to be noted that from time immemorial the Bedwin have recognized no obligation to register births or deaths. This has now come to be regarded by them as a privilege as well founded as the exemption of their males from military service. Indeed it was in order to guard this latter privilege that the Bedwin in the beginning refused to register births or deaths. These conditions, however, have gradually changed : a large proportion of the arabs are now settled in villages, own land or hire land and live the life of fellaheen.

This privilege of non registration of births or deaths is one that ought to go and at once. It is one of the most potent factors in the spread of infectious diseases and its concealment. The matter could easily be arranged if the consent of all Arab Omdas were obtained and at the same time means were taken to assure the rank and file that registration would not jeopardise the precious privilege of exemption from military service."

(iii) Village Barbers.

The village barber in Egypt is of very ancient institution. Without going into his history, it may be said that his duties are mainly the carrying out of vaccination and various minor operations of surgery, the examination of deaths in normal times and the furnishing of information connected with his office to the district authorities. He is not paid by the Government, but receives certain considerations from his clientele, and the realization of these considerations frequently depends on the good will of the Omda. His interest is consequently closely identified with the wishes of the villagers and of the head man.

His rôle in village life, and his responsibilities to his patrons have by no means contributed to independance of character or to a sense of duty to the Government authority which appoints him, though it does not pay him. It is natural therefore that the rank and file of this class is of indifferent quality, and that the really good men (though some certainly exist) are few and far between.

In the year 1908 a new departure was experimentally made, in connection with special measures drafted for dealing with Pneumonic Plague in Upper Egypt. A small credit was obtained for the payment of a few selected barbers of the better class in each province. The distribution of this patronage was governed by the previous character and attainments of the individual, having regard to the necessity of spreading the small number of selected barbers as evenly as possible over the most important areas. The object was to encourage the giving of information of suspicious deaths or illness in the village of the barber, or in any other that might come to his knowledge. In most cases the inducement of a certain fixed, though small salary, was sufficient to obtain what was required.

In all 75 barbers were placed on the " paid " list. As regards the general results of this measure, the Inspector in charge of plague in Upper Egypt reported as follows :—" In only one case did a paid barber fail to report plague on its appearance in his area. In this case the barber was obviously the tool of the Omda, who was refractory to all sanitary measures in his village. The effect in this particular instance was disastrous, as a group of surrounding villages, nine in number, became directly infected."

Reports also from the Mudiria authorities acknowledge the advantage of the system and advocate a further extension of the scheme on a permanent basis.

It should, however, be said that apart from financial considerations, the general mass of barbers are by no means fitted as yet to receive Government pay. The majority are illiterate, many are very inefficient, while in some cases men of indifferent character have been appointed in the absence of more desirable competitors. It is certain, however, that by the erection of the office of village barbers into that of a paid Government servant, similar to the sarraf, considerable encouragement would be given to a more desirable class of men to take up the profession, and as education extends and a class of men grows up able to read and write, they could in addition assume the duty of keeping the village register, which is now done as stated above (very inefficiently) by the Sarraf.

The following decree is appended as an interesting relic of what was done in the time of the late Khedive Ibrahim Pasha.

It will be noted that the village barber, who was assisted by the "daya" in the case of the death of a woman, was paid a fixed sum (P.T. 1) for each death registered, and on account of this payment, he was considered a Government employee, and as such liable to punishment for neglect in carrying out his duties.

Règlement concernant le service des barbiers et leurs femmes, délibéré dans la séance du 11 avril 1848, No. 237, et approuvé par S.A. le Seraskeir Ibrahim Pacha le 2 Regeb 1264.

1° Dans chaque village, par les soins et choix du Médecin en Chef de la Province, un barbier spécial sera délégué pour faire la visite des morts de sexe masculin, en l'absence du Médecin de district.

Dans les villages où il n'y a aucun barbier, le barbier du village le plus rapproché en sera chargé. La préférence en sera donnée aux barbiers qui sont déjà chargés de la vaccination.

2° Pour la visite des cadavres de sexe féminin, seront chargées dans chaque village les femmes des barbiers chargés de la visite des morts de sexe masculin, lesquels seront tenus responsables des visites faites par leurs femmes.

3° Voulant en cela pourvoir non seulement à la visite de tous les morts mais surtout à leur enregistrement complet, le barbier chargé de ce service, après avoir visité le cadavre et constaté possiblement la cause du décès, se rendra auprès du Chef ou du Notable du village où se trouve déposé le registre sanitaire prescrit par le règlement, et en sa présence, ou de qui pour lui, y fera enregistrer le nom, l'âge et la cause la plus probable du décès de l'individu.

Le Sarraf, ou le Nail el Schiar, sera obligé de prêter son concours pour cet enregistrement. Si le décès était de sexe féminin, le barbier, après avoir rédigé la relation de sa femme, qui aura fait la visite, procédera comme ci-dessus pour l'enregistrement.

4° Pour tout cadavre visité et enregistré, tant du sexe masculin que féminin, il sera donné au barbier qui aura fait la visite une récompense d'une Piastre, qui lui sera payée par le Divan de la Moudirieh, suivant un Kechf mensuel extrait du registre du village qui devra être signé par le Médecin en Chef.

5° Par suite de cette rétribution, les dits barbiers acquierront la qualité d'employés sanitaires rétribués par l'Intendance, et par conséquent seront passibles des peines qui peuvent leur être infligées dans le cas qu'ils manquent à leurs devoirs.

6° Les dits barbiers seront subordonnés aux Médecins en Chef du Service, par lesquels, et non par d'autres, ils seront choisis sous leur responsabilité.

7° La visite des cadavres à faire par les dits barbiers et leurs femmes, ayant pour principal but de connaitre si quelques cas de peste venaient à se manifester, ils auront le devoir principal de donner avis aussitôt au Médecin de District de tous cas suspect qui viendrait à se présenter à eux, dans ce cas ils feront suspendre la sépulture et mettront immédiatement en quarantaine la maison et la famille de l'individu jusqu'à ce que le cas ait été vérifié par le

Médecin du District et par le Médecin en Chef, s'ils venaient à manquer à ce devoir ils seraient sévèrement punis. Les dits barbiers seront également tenus de dénoncer à l'autorité locale tout cas suspect d'empoisonnement et autres morts violentes qu'ils constateraient.

8° Voulant donner aux dits barbiers toute l'indépendance qui est nécessaire pour qu'ils puissent exercer consciencieusement et librement la charge qui leur est confiée, ils sont déclarés indépendants de la juridiction des Chefs de Village et exempts des travaux publics et dépendront uniquement du Médecin en Chef de la Province auquel les Chefs de Village devront s'adresser toutes les fois qu'ils auront des plaintes à adresser contre eux.

9° Les Médecins en Chef auront la faculté, lorsqu'ils le jugeront opportun, de charger ces barbiers de la surveillance du service hygiénique du village respectif en l'absence du Médecin de District, quand celui-ci se trouve en tournée, et de cette manière utiliser leurs concours au profit du Service Public.

(iv) Kuttabs.

The Kuttabs (elementary village schools) are productive sources of ophthalmic and other contagious and infectious disease. Considerable improvement in hygienic conditions has taken place in those which are under inspection and control of the Ministry of Education, but multitudes of others still persist in their aboriginal condition of filth and squalor, and much remains to be done.

The desirability of improving and regulating the village Kuttabs from a sanitary point of view is of as great importance to the ultimate efficiency of the Egyptian people as it is from the educational standpoint, for it is in these establishments that the early youth of the peasantry is very largely passed.

Under present conditions the Department is not endowed with the necessary means of dealing with a question of such magnitude, but it is thought that some beginning and initial progress might be made, pari passu, with the movement to improve the standard and position of the village barbers, for as these agents become more trustworthy and efficient it would be possible to make them responsible for a few simple sanitary measures in connection with the Kuttabs.

If the Provincial Councils, in the exercise of their newly extended powers, will apply themselves to dealing with this question they will provide themselves with a useful sphere of activity and their countrymen with reason for gratitude, for physical health and fitness must necessarily be conditional to the best exercise and training of intelligence.

(v) Infant Mortality.

The death-rate of children (under one year), which is always a feature of the spring and early summer in this country, assumed unusual proportions in Cairo in the months of May and June of last year.

The facts reported by Dr. Fergusson Lees are as follows :—

" Towards the end of March (1909) the death-rate of children, under the age of one year, began to rise, the number of deaths for the week ending March 25th being 130, as against an average of 104·7 for the previous 20 weeks. From this time there was a gradual slow rise till the end of April, when the number of deaths occurring in the week ending April 29th was 188. During the course of the next two weeks there were registered 265 and 323 deaths respectively.

" Then took place a sudden, and compared with the previous rate an abnormal rise,

which brought the number of deaths up to 654 for the week ending May 20th. This high rate was continued during the next four weeks, the figures for these being 527, 700, 511, and 553 respectively.

" A sudden drop, comparable to the previous sudden rise, now took place, so that the number of deaths for the week ending July 15th only amounted to 248. From this date onwards, with the exception of a small rise in the week ending August 5th, the number of deaths slowly declined, until by the beginning of December, it had almost returned to the mean of the previous winter."

It is well to mention that high infant mortality is by no means peculiar to Egypt, but is to be observed during the hot weather in all countries where the mean temperature of the hottest months of the year is above 16° C. (approximately 61° F.). It is chiefly the result of digestive troubles, under the form of acute or sub-acute Enteritis, or Gastro-Enteritis, ordinarily known under the name of " summer diarrhœa."

The immediate cause of the malady (or group of maladies) is not known ; no specific bacillus has yet been isolated and exclusively identified with the malady, though observers claim to have found various bacteria belonging to one or other of the groups that are associated with intestinal disease. It is probable, however, that " summer diarrhœa " is not a definite specific disease, but includes various symptomatic maladies, of no very precise or consistent form, but which are due to a variety of bacillary growths, stimulated to unwonted activity by the circumstances of temperature and the reduced power of resistance on the part of the victim.

Meinert has claimed that infantile mortality of the kind under consideration is due to the direct influence of heat, his thesis being that very young children die of a form of heat stroke which their delicate organism is incapable of resisting. The balance of evidence is, however, against this theory, and from careful observations made in Paris, Berlin, Breslau, and Alexandria it seems certain that while infants fed on mother's milk resist whatever adverse influences are in action, those that are fed on preparations of cow's milk, or on milk substitutes, suffer in a particularly fatal manner, i.e., increased infant mortality is associated with the use of food exposed to bacterial infection and the resulting changes.

An additional feature in Egypt is the existence of conditions under which infants of a few months old obtain either by accident or permission access to such unsuitable food as melons, bread, unripe dates, etc. With these conditions are invariably associated overcrowding, heated dwellings, squalor, and the unfavourable circumstances associated with poverty, and habits and intelligence (on the part of the parents) of a low order.

It should also be remembered that the children are as a rule left by necessity on the floor of the houses, and on the ground of the streets or places surrounding the dwellings ; ground which is constantly exposed to organic soiling and which may very readily be specifically contaminated with intestinal germ life, in consequence of the lack of sanitary provisions, the absence of effective conservancy, and the long accustomed habits of the people.

It may also be that flies contribute, by the carrying of infective germs, to the propagation of the disease.

It has been suggested (in a recent article in a medical journal) that a certain proportion of the infantile mortality might be due to Malaria ; there is, however, no foundation for such a supposition and the recent work of Drs. Fergusson and Day * conclusively shews such splenic enlargement as is found in children in Cairo is accounted for by other causes.

---

* On the Spleno-Megaly with Hepatic Cirrhosis endemic in Egypt.

The matter, however, cannot be dismissed in a few lines based on general considerations. The real requirements are serious investigation, careful records of conditions, intelligent enquiry as to the exact causes of death, and further particulars as regards age, locality of residence, social conditions, and other factors that will suggest themselves to the capable investigator. Measures have already been instituted for carrying out investigation on these lines, during the hot weather of this year (1910).

Something also is to be done in the matter of education of the mothers in habits of care and cleanliness ; and study is now being made as to the best methods by which rational care of children can be inculcated in the mothers of the poorer classes.

In this direction the " Lady Cromer " Dispensaries have given a most useful lead. If the influence amongst the poorer classes which these institutions have achieved could be developed on larger lines, if the well-to-do Egyptian could be interested in the work, and brought into an organization for the furtherance amongst their womenkind of the training of mothers in the care of their children, it is not unreasonable to believe that some good might result. But the characteristic apathy of the Egyptian and indeed of the poor uneducated classes of all nationalities, is a persistent difficulty.

It is understood that the Princesses of the Khedivial family have recently decided to establish a society for the protection of infant life ; a movement which is to be welcomed as giving hope of interesting the more fortunate of the people in this country in the condition of life of their poorer compatriots, and the initiation of some organized improvement.

TABLE XVI.

Births and Deaths and Infant Mortality in the Principal Towns for 1908.

Egyptians.

Towns	Total.		Infant deaths.		Proportion % of infant mortality.		
					Deaths under 1 year.		From 1 to 10 years,
	Births.	Deaths.	Under 1 year.	From 1 to 10 years.	To births.	To deaths.	To deaths.
Cairo	31,225	22,721	8,813	5,782	28·2	38·8	25·4
Alexandria...	15,160	10,119	3,924	2,410	25·9	38·8	23·8
Damietta	1,759	779	269	213	15·3	34·5	27·3
Port Said	2,096	974	339	248	16·2	34·8	25·5
Suez	758	532	187	110	24·7	35·2	20·7
Ismailia	440	202	69	57	15·7	34·0	28·1
Benha...	634	522	176	135	27·8	33·7	25·9
Zagazig	1,779	1,249	470	365	26·4	37·5	29·2
Tanta	2,883	2,194	702	663	24·3	32·0	30·2
Mansura	1,978	1,158	409	289	20·7	35·3	25·0
Shibin el Kom	1,094	657	237	146	21·7	36·1	22·2
Damanhur...	1,834	1,271	465	378	25·4	36·6	29·7
Giza	1,037	680	313	170	30·2	46·0	25·0
Fayum	2,271	2,102	810	716	35·7	38·5	34·1
Beni Suef	1,387	986	422	260	30·4	42·8	26·4
Minia	1,628	1,185	499	317	30·7	42·1	26·8
Assiut...	2,363	1,792	640	550	27·1	35·7	30·7
Sohag	995	635	260	180	26·1	40·9	28·3
Kena	1,221	856	323	259	26·5	37·7	30·3
Aswan	581	520	184	133	31·7	35·4	25·6
Grand Total... ...	73,123	51,135	19,511	13,381	26·7	38·2	26·2

TABLE XVII.

BIRTHS AND DEATHS AND INFANT MORTALITY IN THE PRINCIPAL TOWNS FOR 1909.
Egyptians.

TOWNS.	TOTAL.		INFANT DEATHS.		PROPORTION % OF INFANT MORTALITY.		
					Deaths under 1 year.		From 1 to 10 years.
	Births.	Deaths.	Under 1 year.	From 1 to 10 years.	To births.	To deaths.	To deaths.
Cairo	28,540	28,424	10,745	9.414	37·6	37·8	33·1
Alexandria...	14,421	11,954	4,299	3.641	29·8	36·0	30 5
Damietta	1.847	817	291	235	15·8	35·6	28·8
Port Said	2.101	1,229	482	367	22·9	39·2	29·9
Suez	743	577	191	152	25·7	33·1	26·3
Ismailia	344	237	78	86	22·7	32·9	36·3
Benha...	640	512	181	167	28·3	35.4	32·6
Zagazig	1,760	1.282	496	410	28·2	38·7	32·0
Tanta	2.874	2,606	871	770	30·3	33·4	29·5
Mansura	1,978	1,554	559	491	28·3	36·0	31·6
Shibin el Kom	1,094	722	244	198	22·3	33·8	27·1
Damanhur...	1.993	1,885	601	690	30·2	31·9	40·6
Giza	953	1.021	428	413	44·9	41·9	36·5
Fayum	2.318	1,802	782	564	33·7	43·4	31·3
Beni Suef	1,342	1,020	439	305	32.7	43·0	29·9
Minia	1.563	1,441	635	442	40·6	44·1	30·7
Assiut...	2,236	2,020	738	588	33·0	36·5	29·1
Sohag...	928	700	269	197	29·0	38·4	28·1
Kena	1.142	1,182	437	374	28·3	37·0	31·6
Aswan	522	489	176	126	33·7	36·0	25·8
GRAND TOTAL	69,339	61,474	22,942	19,630	33·1	37·3	31·9

TABLE XVIII.

BIRTHS AND DEATHS AND INFANT MORTALITY IN THE PRINCIPAL TOWNS FOR 1908.
Foreigners.

TOWNS.	TOTAL.		INFANT DEATHS.		PROPORTION % OF INFANT MORTALITY.		
					Deaths under 1 year.		From 1 to 10 years.
	Births.	Deaths.	Under 1 year.	From 1 to 10 years.	To births.	To deaths.	To deaths.
Cairo	424	943	174	147	...	18·5	15·6
Alexandria...	481	908	193	128	...	21·3	14·1
Damietta	3	1	...	...	...	...	...
Port Said	172	152	34	16	...	22·4	10·5
Suez	4	61	9	10	...	14·8	16·4
Ismailia	73	19	3	1	...	15·8	5·3
Benha...	...	1	1	...	...	100·0	...
Zagazig	12	13	3	5	...	33·1	38·5
Tanta	62	46	9	11	...	19·6	23·9
Mansura	28	24	6	5	...	25·0	20·8
Shibin el Kom	1	3	...	...	...	...	...
Damanhur...	10	9	5	...	...	55 6	...
Giza	...	2	1	1	...	50·0	50·0
Fayum	4	9	2	1	...	22·2	11·1
Beni Suef	8	...	...	...	...	...	...
Minia	2	7	3	1	...	42·9	14·3
Assiut...	6	5	1	1	...	20·0	20·0
Sohag...	...	...	...	...	...	...	...
Kena	1	2	1	...	...	50·0	...
Aswan	8	10	4	...	...	40·0	...
GRAND TOTAL...	1,299	2,215	449	327	...	20·3	14·8

TABLE XIX.

BIRTHS AND DEATHS AND INFANT MORTALITY IN THE PRINCIPAL TOWNS FOR 1909.

Foreigners.

TOWNS.	TOTAL.		INFANT DEATHS.		PROPORTION % OF INFANT MORTALITY.		
					Deaths under 1 year.		From 1 to 10 years.
	Births.	Deaths.	Under 1 year.	From 1 to 10 years.	To births.	To deaths.	To deaths.
Cairo	383	962	219	192	...	22·8	20·0
Alexandria...	758	1,006	200	174	...	19·9	17·3
Damietta	2	3	2	...	...	66·7	...
Port Said	154	150	25	13	...	16·7	8·7
Suez	4	67	6	1	...	9·0	1·5
Ismailia	98	39	12	3	...	30·8	7·7
Benha...	2	2	...	1	...	...	50·0
Zagazig	24	15	7	2	...	46·7	13·3
Tanta	59	37	7	11	...	18·9	29·7
Mansura	12	28	7	4	...	25·0	14·3
Shibin el Kom	...	1	...	1	...	...	100·0
Damanhur	9	5	2	1	...	40·0	20·0
Giza	2	6	4	1	...	66·7	16·7
Fayum	2	8	4	1	...	50·0	12·5
Beni Suef	4	7	1	2	...	14·3	28·6
Minia	5	4	1	1	...	25·0	25·0
Assiut	3	2	1	...	...	50 0	...
Sohag	1	...	...	...	...	...	...
Kena	1	3	2	...	...	66·7	...
Aswan	4	9	1	1	...	11·1	11·1
GRAND TOTAL...	1,527	2,354	501	409	...	21·3	17·4

B.—INFECTIOUS DISEASES.

The chief features with regard to infectious disease during the year were :—

(i) A very marked diminution in the plague incidence throughout the country, but more especially in Upper Egypt;

(ii) The continuation in Cairo of the small-pox epidemic which broke out in the early winter of 1908;

(iii) A marked outbreak of enteric fever at Helwan in March; and,

(iv) A similar outbreak in Cairo in December.

(i) PLAGUE.

The total number of declared cases of plague in the country during 1909 was 513 (of these 498 were Egyptians, and 15 Europeans), as against 1,511 in 1908. The deaths were 207, as compared with 780 in 1908.

The figures show a satisfactory diminution on the previous year, particularly as regards mortality; this latter feature is due to the very marked decrease of pneumonic plague (the most dangerous form of the disease), which has dropped to 9 cases only in 1909, as compared with 168 in 1908, and 250 in 1907.

There is little doubt that the special organization established two years ago for dealing with plague in the southern provinces has materially assisted in the control and the reduction of the incidence of the disease. It is this organization also which has given the departmental Officers experience, and has explored and emphasized the lines on which useful provincial health administration might be established.

In 1899, when plague first broke out, there was practically no organization for dealing with epidemic disease on a large scale. No staff or funds were provided for disinfection or for isolation, and but a very small grant for attendance on cases isolated.

At that date a disinfecting station with a steam disinfecting apparatus existed in but a very few of the large towns; since then the organization has been extended, and a chief disinfector and staff have been supplied to each Mudiria. A supernumerary staff of trained disinfectors has been kept in readiness at headquarters. A Plague Medical Staff has been organized, headed by two Inspectors, and local Plague Stores have been established in certain districts, the distance of which from Cairo formerly led to great delay and expense in the forwarding of the required materials.

The general measures adopted have been based on the principles of :—

1. Isolation of the sick.

2. Disinfection of the persons, clothing and bedding of "contacts."

3. Isolation of contacts in pneumonic and septicæmic cases and of suspect contacts in bubonic cases.

4. Disinfection of the "field of contagion," this being regarded as a question of site and area in the bubonic outbreaks, while in the pneumonic and septicæmic forms it becomes a question of individuals and is generally covered by the immediate neighbours and the "family tree."

5. Measures against rats.

Two factors make the work in pneumonic plague a matter of no little magnitude and difficulty :—

(*a*) The marked personal infectivity of the disease ;

(*b*) The customs of the fellaheen which render it usual for a sick man to be visited by all his relations near and far.

This makes it necessary to isolate all the branches of an infected family so that the occurrence of one case entails the isolation of a very large number of people—anything up to eighty and usually above fifty—and it is seldom that less than three or four families have to be isolated.

Almost always all the people to be isolated are engaged in urgent work of some sort, men women and children ; they do not understand the principles which make necessary their strict isolation ; the work has to be encompassed speedily and the escape of a contact may mean the spread of the disease to the surrounding villages.

It will be seen that these measures dislocate to no small extent the ordinary tenor of quiet village life. When the ignorance of the Saieedee fellah is considered it is surprising how little objection is raised to the required steps.

There is no doubt that for this country measures of the kind indicated are those best adapted to deal with the people and the disease, and there is still less doubt that when efficiently and conscientiously carried out a considerable degree of success attends their application ; for when early information is obtained and the trained personnel and stores are immediately available the outbreak quickly subsides, and does not recur. On the other

hand, if early information is withheld the infection gathers force and extent and its control is often a matter of great difficulty and strain. So many examples are on record to illustrate this statement that it has become an unquestioned axiom in plague administration in Egypt.

Doubt was recently cast at a meeting of the Royal Society of Medicine in London as to the efficacity of measures of isolation and disinfection; that it may be difficult to carry out these measures with efficiency in the vast extent of India and amongst its mixed population may readily be believed, but it is certain that in Egypt (with the comparative exceptions of Alexandria and Port Said), and under normal condition, individual outbreaks can readily be and have been controlled by these measures and so far limited as to give rise to none other than the first case or cases, with possibly a few amongst the first contacts. A difficulty which is frequently met with is the tendency of the people to conceal their clothing and bedding under the belief that these will be injured by disinfection—when an outbreak continues with "dropping cases" at intervals, it is practically certain that this is the cause in almost every instance—but special measures can be readily taken to reduce this difficulty, and when that is done it may be said that the outbreak very soon cedes to the measures.

The question of inoculation has also been considered, but it would not appear to be suitable for general use in this country for the following reasons :—

1. Its undetermined time value; a person inoculated in one season might readily be vulnerable in any succeeding season.

2. Any subsequent misfortune in health to the individual would certainly be attributed by public opinion to its use, and the consequent unpopularity of the Health Department and of the Government which imposed it would be a certain result.

3. By the present measures it has been shown that outbreaks can be limited and terminated, and the obtaining of the necessary confidence of the people for carrying out these measures in their most strict form will be realized far sooner than that degree of confidence which alone would permit of inoculation being carried into affect.

It is probable that this operation would *never* be willingly accepted by contacts, but the recognized measures are frequently accepted willingly and without need of compulsion.

As regards the general incidence of the disease there is little doubt that in certain parts of Lower Egypt plague is assuming an endemic form, the cases are not usually numerous and the mortality is not specially high. The form of the disease is bubonic, consequent on infection through the skin and usually associated with a rat infected area. In the southern provinces of Upper Egypt the form is commonly pneumonic, fulminating in its intensity and speed, universally fatal; and the infection is by means of the respiratory tract.

Further, it is found that of the cases dealt with by the Department the Sudanese, the Berberis and the Saieedees (natives of Upper Egypt) are more especially liable to the pneumonic form, it would appear that the nearer the ethnological type approaches the negroid, the darker his skin, and the nearer his habitat approaches the tropics the more vulnerable is the individual to the attacks of the plague poison.

These facts readily explain the genesis of the Upper Egypt outbreaks. Many of the natives of that part travel northwards to the ports and other towns of the Delta in search of work. An individual contracts the disease by skin infection in a plague area; he, as is the habit of these people, immediately flies to his village when he finds himself seriously

ill—the infection generalizes itself by passing through the lymphatic glands to the general circulation and the individual develops a septicæmic form commonly with secondary pneumonia ; he reaches his village in a moribund condition and immediately becomes the centre of a respiratory infection amongst his family and friends who collect round his death-bed. This is a typical history of what repeatedly happens and represents the reason for which early information and a trained staff, ready for action, are such essential factors in plague administration in Upper Egypt. It is fortunate that such provision has frequently enabled the further extension of the disease in the locality to be prevented ; for it is certain that without it the mortality from pneumonic plague would have assumed very large proportions in an area that is already too scantily populated and which requires a considerable degree of hand labour alone to cultivate the land that is being brought under summer irrigation.

The following tables, Nos. XX and XXI, give some interesting statistics regarding the incidence of plague since its first beginning in 1899.

TABLE XX.

RECAPITULATION.

Years.	Cases.	Deaths.	Deaths per cent.
1899...	93	45	48
1900...	127	60	47·2
1901...	205	102	49·5
1902...	481	291	60·0
1903...	303	160	52·7
1904...	854	501	58·6
1905...	266	181	68·0
1906...	631	475	75·2
1907...	1,253	914	72·9
1908...	1,511	780	51·6
1909...	513	207	40·5
TOTAL ...	6,237	3,716	

NOTE.—The districts of Faraskur (Dakahlia) and that of Giza (Giza) have been for the first time infected in 1909.

TABLE XXI.

TOTAL CASES OF PLAGUE, FROM JANUARY 1st TO DECEMBER 31st 1909 (FROM DAILY BULLETINS).

TOWN OR DISTRICT.	PROVINCE.	REMAINING.		NEW CASES.		DEATHS IN HOSPITAL.		CURED.		REMAINING.			DEATHS OUTSIDE HOSPITAL.	
		Egyptians.	Foreigners.	Egyptians.	Foreigners.	Egyptians.	Foreigners.	Egyptians.	Foreigners.	Egyptians.	Foreigners.	Total.	Egyptians.	Foreigners.
Alexandria... ...	...	...	...	10	6	6	4	4	2	...	...	...	7	...
Port Said	...	...	...	10	9	4	4	6	5	...	...	...	7	...
Tanta	Gharbia	...	...	5	...	2	...	3	...	...	...	...	2	...
Kafr el Zayat ...	,, ...	...	...	6	...	1	...	5	...	...	...	...	1	...
Zifta	,, ...	...	...	54	...	8	...	46	...	...	...	...	5	...
Dessuk	,, ...	...	...	1	...	1	...	...	...	...	...	...	...	...
Sarter	,, ...	...	...	1	...	1	...	...	...	...	...	...	...	...
Damanhur	Behera	...	...	31	...	11	...	20	...	...	...	...	3	...

TOTAL CASES OF PLAGUE, FROM JANUARY 1ST TO DECEMBER 31ST 1909, ETC. — *continued.*

TOWN OF DISTRICT.	DISTRICT.	REMAINING.		NEW CASES.		DEATHS IN HOSPITAL.		CURED.		REMAINING.			DEATHS OUTSIDE HOSPITAL.	
		Egyptians.	Foreigners.	Egyptians.	Foreigners.	Egyptians.	Foreigners.	Egyptians.	Foreigners.	Egyptians.	Foreigners.	Total.	Egyptians.	Foreigners.
Aga	Dakahhia	...	...	5	...	5	...	...	...	...	...	...	...	...
Fareskur	„	...	...	1	...	1	...	...	...	...	...	...	...	...
Benha	Galiubia	...	...	2	...	...	...	2	...	...	...	...	...	...
Tukh	„	...	...	17	...	2	...	15	...	...	...	...	...	...
Menuf	Menufia	2	...	63	...	10	...	55	...	...	...	...	5	...
Ashmun	„	14	...	7	...	5	...	16	...	...	...	...	1	...
Kuesna	„	...	...	39	...	7	...	32	...	...	...	...	2	...
Beni Suef	Beni Suef	...	...	2	...	...	...	2	...	...	...	...	...	...
Wasta	„	...	...	9	...	3	...	3	...	3	...	3	...	...
Fayum	Fayum	...	...	13	...	5	...	8	...	...	...	...	6	...
Etsa	„	...	...	8	...	3	...	5	...	...	...	...	1	...
Sennures	„	...	...	26	...	10	...	16	...	...	...	...	18	...
Minia	Minia	...	...	18	...	8	...	8	...	2	...	2	...	...
Samalut	„	...	...	...	...	...	...	...	...	...	...	...	1	...
Beni Mazar ...	„	...	...	1	...	...	...	1	...	...	...	...	...	...
El Fashn	„	...	...	1	...	...	...	1	...	...	...	...	3	...
Assiut	Assiut	...	...	5	...	...	...	5	...	...	...	...	1	...
Deirut	„	...	...	59	...	8	...	41	...	10	...	10	11	...
Mallawi	„	...	...	13	...	8	...	5	...	...	...	...	8	...
Manfalut	„	...	...	1	...	...	...	1	...	...	...	...	...	...
Abou Tig	„	...	...	...	...	...	...	...	...	...	...	...	...	...
Girga	Girga	...	...	...	...	...	...	...	...	...	...	...	2	...
Tahta	„	1	...	2	...	3	...	...	...	...	...	...	1	...
Baliana	„	...	...	...	...	...	...	...	...	...	...	...	1	...
Giza	Giza	...	...	1	...	...	...	...	...	1	...	1	...	...
	TOTAL	17	...	411	15	112	8	300	7	16	...	16	87	...

Number of cases 513 ; Number of deaths 207 ; Number cured 307 ; Cases under treatment 16.

In reflecting on the advent of plague it occurs to the thoughtful person that it has not perhaps been without its advantages to the Government and people of this country, a reflection which arises from the following considerations.

A prolonged campaign such as that which has been waged against plague in Egypt for the last ten years has many indirect effects besides the direct effect of rendering a deadly disease comparatively harmless ; it renders death registration more complete, it calls attention to unhealthy conditions of life and to the necessity of Municipal improvements, and it trains the Medical Staff in the same way as active service trains an army.

There are many indications that plague in this country is assuming an endemic form. Experience in India and elsewhere has shown that this stage may last for years, so that the problem of organized dealing with plague in Egypt may in the near future be not very different from the problem of dealing with other infectious diseases, such as small-pox, typhus, and relapsing fever.

The plague organization and incidental expenditure has hitherto been met by special credits, granted as opportunity required ; but this year they have, for the first time, been framed on calculated estimates, and included in the ordinary budget.

As regards the cost of plague measures, it has been the fashion to declaim against the alleged extravagance of the credits demanded. The sums granted, though large, are perhaps not relatively so great as is sometimes imagined. Leaving out the figures for last year, which are not available, and taking a period of ten years, from 1899 to 1908, the amount

spent has been L.E. 327,000. Deducting the sum of L.E. 78,000 which has been disbursed by the Quarantine Board during the period, a remainder of L.E. 249,000 is left, which represents what has been spent by this Department on dealing with plague within the country. Roughly, L.E. 25,000 a year, this sum works out at a little over 2 milliemes (i.e., one half-penny) per year per head of the population, and of the total yearly revenue, it is less than one-six hundredth part.

A comparison of the cost of dealing with epidemics in Egypt and elsewhere is difficult, for the cost of dealing with infectious diseases, which in other countries is a municipal or local charge, must here be borne entirely by the central Government.

As plague enters into its endemic stage it would be sound policy tending to both efficiency and economy to gradually transform the plague machinery into a general prophylactic organization, thus linking it up and consolidating it with the main body of the Department ; it would only be necessary to transfer year by year from the plague credit to the ordinary budget a sum sufficient to maintain permanently the organization already established, so that Egypt may finally be able to deal with all infectious diseases upon modern and scientific lines.

In order to complete the organization there is still much to be done, but all could be readily achieved by steady purpose if the Government decided to go forward on the lines suggested.

First, it will be necessary to arrive at the promulgation of a law on Infectious Diseases.

Such a law is now under the consideration of the Government, and the Department has reason to believe that it will soon be placed on the Statute book.

Secondly, the provision of infectious hospitals is also of importance.

Accommodation for infectious diseases already exists in some of the provincial towns. Cairo possesses sufficient accommodation for the poorest classes, but has no accommodation for a better class or for paying patients. Negociations are now being carried on with the Ministry of Finance, and it is hoped that the necessary credit will shortly be granted. It is true that this accommodation will be chiefly used by Europeans, and it might be considered that the various communities should provide for their own nationals ; but it matters not to the Government whether the infected person is a European subject or an Egyptian, he is a source of infection for the whole population, and as such must be dealt with by the authority in charge of the health of the country without distinction of nationality.

In the villages, isolation is usually carried out in tents or temporary huts. In the colder months some hardship arises from this method of isolation, and it has been proposed that each village should erect a mud-brick building outside the village for the purpose of isolation. The expense would be small, and many villages have expressed the desire of making this provision. It is hoped that the Provincial Councils will be able to assist in this movement.

Thirdly, notification of infectious diseases depends largely upon efficient death registration, and this will never be attained (as has been already pointed out) unless a paid Public Health agent is appointed in each village to assist the Omda in this branch of his work.

Finally, it will be necessary to link up the internal organization for dealing with infectious diseases with the external organization in charge of the Quarantine Board. The latter deals with infected ports, but a victim of cholera may land in Egypt before the first case has been declared by the local authorities abroad. The first sign of disease may not appear until the day after landing, and having passed the Quarantine, nothing may be heard

of him until half-a-dozen centres of disease have been definitely established. Quarantine is essential for Egypt, but its strongest advocate would not claim infallibility for it.

Once a passenger is landed at an Egyptian port, the responsibility of the Quarantine authorities ceases, and that of the Public Health Department begins. The first line may be passed and the chain of defence will not be complete until the work of the Quarantine Board and of the Public Health authorities at the ports is securely linked up. There is here no antagonism, but a division of labour, which has been proved by experience to work smoothly and well.

The completion of the Hedjaz railway and its utilization by returning pilgrims makes this question urgent, and for that reason the Department would welcome the re-establishment of a permanent port service in the near future. If this service was organized on the tried principle of combining and co-ordinating public health and public security one branch of it would deal with infectious diseases, and the other with the control of undesirable characters and the white slave traffic.

If, therefore, the advent of plague has enabled the Government to profit by the experience gained, to discover deficiencies in health provision, to realize more accurately the sanitary needs of the country and have a clearer idea of the imperative necessity of a trained personnel, of preparation and organization in advance, in order that it may reduce the danger of other scourges to the people, then the much-dreaded " plague " will not have visited Egypt without bringing in its train some advantages already realized and others in prospect.

(ii) Small-pox and vaccination.

There is always a very considerable aggregate number of cases of small-pox in the various parts of the country. It is undoubtedly due to deficient vaccination, to the difficulty of dealing with the wandering Bedwin, and to the very considerable number of vagrants that persistently travel from district to district.

An organized effort is now being made to take portions of the provinces, one by one, and carry out systematic vaccination. The fact of there being no legal enactment to enforce re-vaccination is perhaps a contributory cause to the prevalence of small-pox, and it is this defect that it is sought to correct by administrative measures.

The Vaccine Institute of the Department provides the vaccine, and of this no less than 1,143,000 units have been manufactured, and 1,083,000 distributed.

The total number of cases in the Cairo outbreak was 453, with 98 deaths.

The total number of cases throughout the country was 4,004, as against 2,698 in 1908.

47 Tent Hospitals, providing 584 beds, were despatched from the Central Stores for dealing with the local outbreaks.

TABLE XXII.

Vaccinations and revaccinations with success.

	1907–1908.	1908–1909.
November and December	74,919	82,329
January 1st to October 31st	424,926	391,274
Total	504,845	473,603

(iii and iv) Typhus and Relapsing Fever.

Typhus and relapsing fever were accountable for 4,563 admissions to hospital, and 1,192 deaths, in 1909, as against 3,743 cases and 835 deaths in 1908.

In addition to such provision as in some cases could be made by drawing on local stores, 63 Tent Hospitals, providing 94 beds, were issued from the Central Stores for dealing with the various outbreaks throughout the country.

In connection with these diseases, the most important matter is the carrying out of careful enquiry as to their etiology, and the channels of infection. Dr. Dreyer had already made a beginning in a most interesting and valuable work connected with transmission of relapsing fever, but has been obliged to relinquish operations for the time. It is hoped that the enquiry may be taken up again as soon as an adequate staff can be obtained for the laboratory.

(v) Measles.

Measles were also prevalent to a greater extent than in the previous year. No less than 4,258 cases and 2,240 deaths from this cause were registered in 1909, as against 2,262 and 1,217 respectively in 1908.

This malady is one of the most difficult of health problems to deal with in this country. Isolation and limitation of infection are practically impossible under the conditions of village life; while the ignorance and indifference of parents in neglecting simple precautions against exposure after the primary fever is over is the cause of the chest troubles and consequent very high mortality that characterizes the disease in this country.

(vi) Diphtheria.

Diphtheria also was on the increase. The number of cases registered was 1,101, and of deaths 513, as against 487 and 253 respectively in 1908.

Efforts are made to bring the use of prophylactic serum within reach of every one, and the results as shown by the immunity of contacts are encouraging.

No less than L.E. 1,070 was spent on diphtheria serum in 1909, and 8,166 doses were issued.

With regard to the prevalence of diphtheria at Port Said Dr. Williams, the then acting Medical Officer of Health, writes as follows :—

" The reason for the prevalence of this disease (diphtheria) is to be found in the insanitary conditions of life of the people. It only requires the introduction of the disease for it to spread, as all the conditions which favour it are present.

" The retention of moisture and decomposing animal and vegetable refuse in and on the surface soil is well recognized as having a direct causal relationship with diphtheria. Though the surface of the streets are dry, the ground inside the houses is always damp; the floors are very rarely cemented or otherwise made impermeable, and where the inhabitants are not living directly on the bare ground, as is the case with the poorer people, they are often only separated from it by a few thin planks, placed, either directly on the damp earth, or not infrequently separated from it by a pool of water or of sewage issuing from

the barrel sunk in the corner of the room, or under the staircase (where one exists), such barrel serving as the family latrine.

"Even in the cases of the people inhabiting better houses the latrines arrangements are always hopelessly insanitary, and the usual manner in which the "fosse" ventilates itself is by means of the latrines leading into it.

"Drainage with proper house connections and disconnections will no doubt do much to diminish the number of cases of this disease."

(vii) Enteric Fever.

There is always a certain amount of enteric fever in the country, which is specially notable in the larger centres of population, and amongst the less immune of the white population and visitors.

The year 1909 produced two very marked outbreaks, the first involved 15 persons in this country, and it has been stated that the illness developed in some persons after they had left for Europe. This outbreak was very carefully investigated, and was proved to be due to a "carrier" in the person of a European servant of the hotel involved.

The second outbreak involved 18 persons. This outbreak was also investigated by the same official (Dr. Fergusson Lees) who carried out the enquiry regarding the first series of cases. The investigation proved intricate but extremely interesting, and subsequently demonstrated the outbreak to be due to a local water infection occurring in an emergency tank on the roof of the building.

There is probably no infectious disease which can be more efficiently controlled by adequate scientific measures than enteric fever, but for this legislation is necessary. At the present time all the most simple and effectual resources and expedients can only be realized by the tact and personal influence of the Medical Officers of this Department. It is entirely beyond their power to impose by law the most simple precautions for the prevention of a most dangerous illness.

(viii) Malaria and Mosquitoes.

There are four places in Egypt in which anti-mosquito measures are carried out, viz., Cairo, Port Said, Suez and Ismailia.

Cairo.—Here a campaign on a limited scale has been in progress since 1902. It owed its origin to the energy of Sir William Willcocks, but it is understood that after a time the movement languished until taken up by the late Director-General of this Department, when funds were provided and a more organized procedure adopted.

At first confined to Kasr el Dubara the system was subsequently extended to a number of buildings in the neighbourhood of the Mixed Tribunals, and afterwards to a few other isolated localities including the island district of Gezira.

The means employed consist mainly in the oiling of cess-pools, the wiring of ventilators and the removal of casual collections of water in tubs, flower and garden water pots, zeers and similar utensils.

In the time of high Nile infiltration, water floods the basements of low-lying houses; these flooded basements are oiled.

No mystery attaches to the regular treatment of cess-pools, this is a simple matter

and soon becomes a mere affair of routine such as any householder can carry out for himself, as indeed is done in many cases.

It should be noted, however, that petroleum cannot be advantageously used in the case of well-constructed modern sanitary installations (such as are the rule in the better class residential districts), for it clearly interferes with the biological action in the filter beds, and if any reliance is placed on the proper functionment of percolating pits it is apt to be misplaced where petroleum is used, for the oil forms a firm and impervious coat on the side of the fosse thus effectually preventing that diffusion of the liquid on which the proper functionment of the pit depends.

Experience shows that closing of the inlets and outlets by water-seal traps and wiring is the proper course in such cases.

With regard to the results obtained by the campaign outlined above a varying amount of success has been obtained, but in no case did it reach the standard which would permit of dispensing with mosquito curtains. This is due to the fact that the operations cover only a very minute proportion of the area of Cairo and its suburbs—if the whole city were included the cost would amount to some L.E. 30,000 per annum ; a sum which could ill be spared from other and more urgent works, for it must be pointed out that the benefit conferred by the type of mosquito campaign described above is to all intents and purposes a luxury in this country. In the present state of knowledge it cannot be considered a health measure of urgency or prime importance for the mosquitoes warred against are those of the Culex and Stegomyia species, types which are only known to carry yellow fever and filariasis ; yellow fever is unknown in this country, and filariasis in Cairo is practically non-existent ; it follows therefore that the extension of these measures to the whole of Cairo at a prohibitive cost would be an unjustifiable extravagance of the most reckless nature.

The policy recommended is :—

1. Carrying on the usual routine until the completion of the drainage scheme which is the real solution of the Culex and Stegomyia mosquito problem ;

2. The gradual filling of existing low levels ;

3. Legislation to regulate buildings so that no basements or unfilled excavations should be permitted below the level of high Nile.

It is unfortunate that owing to the loose statements and lack of accurate observation on the part of enthusiastic missionaries of mosquito enterprise the ordinary urban anti-mosquito work such as that described above has come to be regarded by the general public as an anti-malarial measure. It is unfortunate because it magnifies and complicates real malarial problems and also causes the public to be unreasonable in their estimation of what they may rightly claim should be done for them by the State.

It is the experience of most workers in mosquito reduction that the problem of getting rid of Anophelines—the real antimalarial factor of the enterprise—is to a considerable extent separable from the general crusade against the other two species because Anophelines demand conditions in their breeding places (such as light, etc.), which are not necessary for Culex and Stegomyia ; and in Cairo as well as other urban areas in Egypt the two questions are notably separate and distinct, thus :—

during the whole year cess-pits are producing Culex and Stegomyia ;

during the three months of the high Nile flooded basements are producing the same species.

This is the Culex and Stegomyia problem, and the work on it has sometimes been wrongly called anti-malarial work.

The real anti-malarial problem concerns only the treatment of the breeding places in the open; and in Cairo, where there is but scanty rainfall, these have the special feature that they are provided only by the annual rise of the Nile and the consequent fluctuation of the level of subsoil water.

In Cairo and the suburbs Anophelines are not met with except during the months of August, September, October and November; during these months the subsoil water, following the movements of the river level outcrops in low-lying parts; and in the open pools thus provided, Anophelines (as well as Culex) breed in large numbers. These breeding grounds are found mainly in suburban districts, but also to some extent in the pools on waste land and excavated building sites within the city boundaries. Thus, during these months Cairo is a potential malaria centre; that it is not, practically speaking, an actual malaria centre may to some extent be due to the fact that prior to 1908 there was a long series of low Nile floods. It is certain, however, that there must be some other existing factors as yet unknown which are essential to the transformation of a potential into an actual centre of malarial infection; on this point more work of investigation is required, particularly in the direction of ascertaining the conditions which determine the carrier faculty of the Anopheline, rather than in the direction of research which has for its main result the multiplication of sub-species.

The statement made above that practically speaking Cairo is not an actual malaria centre is borne out by the admission rate at Kasr el Aini Hospital; during the last two years only eight cases of the disease were admitted, and of these in only two was there any suspicion even that the disease had been contracted in the neighbourhood of Cairo.

The danger then, if danger there be, is not the actual state of affairs, but the possible developments, if the flood levels of the last two years are maintained. The question is fortunately an easy one, for if the pools of subsoil water be suppressed the problem is solved. Temporary measures are of little use; these collections of infiltration water obviously cannot be drained or "pumped dry"; oiling is also useless, as the petroleum is rapidly blown to the leeward side; reliance on the introduction of natural enemies is only justified if there is no undergrowth to protect the larvæ.

The only method which will give satisfaction is that of raising all the low-lying areas to such a height, that even in a high Nile flood the infiltration water will not appear on the surface.

The filling with ordinary earth would be a costly process, but fortunately there is available a large supply of a material which is suitable, with certain precautions, both for building and agricultural land; that material is street and road sweepings, and the use of a thin covering layer of ordinary earth avoids in the main the nuisance of smell and flies. This method was applied many years ago in some of the provincial towns for the filling of specially objectionable birkets and its satisfactory results have encouraged the adoption of the method in Cairo. The work is now proceeding as rapidly as the supply allows, there is much to be done, but when it is completed the malaria problem in Cairo will probably be finally settled, for indeed it in no way depends on the most liberal or lavish expenditure of petroleum.

In *Port Said* a very distinct improvement has attended the execution of anti-mosquito (Culex and Stegomyia) measures, and for two reasons. In the first place few waste

areas exist, the town is isolated and compact and therefore the whole can be easily visited weekly by the comparatively small staff of two gangs. In the second place the disturbing factor of an infiltrating high Nile is entirely absent. The malaria problem does not exist at Port Said.

In *Suez*, malaria still exists, but the difficulties of exterminating it here are great and unlimited funds are not available. Much progress has, however, already been made and during the last eight months many of the breeding grounds have been abolished by drainage. Good work is being done by an association of the owners and cultivators of land on which the chief breeding places are found. This antimalarial society, organized by Dr. Creswell, has been of much service to that official in his quietly and steadily conducted campaign.

In *Ismaïlia*, which has so frequently been cited as the original superlatively malarious district of Egypt, distinguished success has attended the anti-mosquito measures. The methods by which this place was freed of the disease are too well known to bear repetition ; they are well described in the work of Dr. Pressat, the medical officer of the Canal Company to whom is due the credit for the initiation (in 1902) and achievement of the campaign. In the autumn of that year Professor Ross visited Ismailia and was able to report that " Mosquitoes can be extirpated with great facility at Ismailia, in fact with greater facility than in any other town I have seen,"—and again—" the illness does not appear to be such a severe type as I have met with in parts of India and Africa, and *no deaths have been reported.*"

In general it may be said that the form of the malady, wherever it has been found in Egypt, is of the benign tertian type ; under these circumstances it would appear therefore that more accurate knowledge regarding the incidence of malaria in Egypt is required before the Department would be justified in recommending the expenditure of large sums in so-called anti-malarial measures which might in the present state of knowledge be either entirely unnecessary or fail in attaining their object. In accordance with this order of ideas an enquiry into the prevalence of malaria was begun in the autumn of 1909 ; a tract of country extending from Ismailia to Tel el Kebir has been surveyed, as also have parts of Cairo and the neighbouring district.

The preliminary reports of this investigation are now in hand and will form the basis of further work when the seasonal stress of plague is passed and the Inspector charged with the duty thus enabled to again devote his time to it.

C.—SANITARY DEFENCE.

(i) Passenger and Immigrant Control.

Egypt, situated as it is on the direct road between the East and the Mediterranean countries of Europe, is specially in need of a well organized system of sanitary defence, both in the direct interest of the country itself, and also in that of Europe which may suffer by the propagation of dangerous disease in a country which lies at the doors of the Mediterranean littoral.

This thesis is no new one, but is that which inspired for the protection of Europe the old organization of "médecins d'orient" and later the series of International Sanitary Conventions terminating with that of Paris in 1903.

The ideas which dominated action in the earlier days were certainly of the restrictive nature usually associated with the word "quarantine," but more recently—as the result of the progress of science—it has been realized that security cannot be obtained either for a country itself or for those with which it is in communication by mere measures of "quarantine." It is imperative that these be supplemented by developing and perfecting the sanitary organization of the interior in such a way that not only shall existing infectious disease be brought under control, but that internal means shall be established for the suppression as speedily as possible of infections brought from without.

In other words effective control of the land and sea frontiers making it possible to establish a well organized medical inspection or "scrutiny" for the purpose of identifying and eliminating sanitary "undesirables" or suspects forms the first line of defence; the establishment of arrangements for detaining undesirables or tracing suspects forms the second, while the third is constituted by an efficiently organized sanitary personnel throughout the interior of the country.

The rational principles of sanitary defence may therefore be summarized as follows:—

1. The prevention as far as possible of the *introduction* of disease.

2. The surveyance and control of such foci of infection as may in the persons of the undesirable or suspect, enter the country by eluding the measures for the prevention of the introduction of disease.

3. The rapid bringing into action of means directed to the extinction of such foci as they arise.

The responsibility for realizing the first principle of this defence lies in Egypt with the International Quarantine Board supplemented, it is proposed, by the Department of Public Health; it remains with the Egyptian Government to provide the second and third.

For the effective realization of the second principle it is essential that the instrument used should be in close relation with the administration competent to deal with the first phase, and it is satisfactory to be able to report that when the Departmental Port Service was in operation in 1908 the most cordial relations were established to the mutual benefit of both services.

The third phase depends on local or village organization already referred to, and the degree of perfection to which rapidity of information on one hand and efficiency of action on the other may be brought into effect.

Experience in Egypt of the working of a rudimentary organization based on the lines indicated above has been somewhat uneven, but instances have occurred where the machinery has done unexpected good work.

It is from the very nature of things difficult to estimate those risks which have *not* culminated in serious outbreaks of infectious disease, but two well-marked instances are on record of the utility of such an organization as the Departmental Port Service. These are, firstly, the occurrence of the earliest cases of plague in Suez two years before the actual outbreak of the disease in Alexandria in 1899. These cases and their contacts were isolated, and no further extension of the disease took place. The country was therefore saved, from the financial point of view alone, at least two years expenditure on plague measures.

The other instance is connected with the cholera infected pilgrimage of 1907-1908,

when cholera-laden ships from the Black Sea were pouring their pilgrim loads through the Suez Canal on the outward journey, and the home-coming pilgrims—the survivors of a stricken pilgrimage—were hurrying to their own countries by any route that offered ; by the orthodox road to Tor (the Quarantine Camp in the Gulf of Suez) as well as by the unauthorized routes across the Red Sea, along the Eastern coast of the Gulf of Suez, through the country of Sinai and the Isthmus of Suez, by the Hedjaz railway into Syria, and so back to this country by the northern ports on the Mediterranean.

Threatened as it was on almost all sides from October 1907 until April 1908, Egypt was fortunate enough to avoid a settled infection of the country, and to escape a repetition of the cholera epidemics of 1895–96, and 1902.

It may here be of interest to reproduce a Departmental Note on the situation and on the preparatory measures undertaken, which was drawn up at the time for information of the Government and guidance of those interested. It runs as follows :—

Measures against cholera, 1908.

" During the month of September 1907, cholera was reported to be prevalent in Southern Russia, and to be in close relation with certain Black Sea ports.

" In view of the approaching Mohammedan pilgrimage, which would bring large numbers of the inhabitants of the musulman population of Western and Middle Asia through the Black Sea, on their way to the holy places of Islam, the acting Director-General of the Public Health Department, Colonel Garner, considered that measures should be taken to prevent the uncontrolled landing of these pilgrims in Egypt. Arrangements were therefore made with the Quarantine Board to pass these persons through as quickly and safely as possible, either by pilgrim ships completing the transit of the Canal in quarantine, or by handing over to the Health Department those who landed at Alexandria or at Port Said, for conveyance by special trains under conditions of isolation to Suez, where they were again embarked under the supervision of the Health Authorities.

" The wisdom and utility of this measure may be judged by the result which followed the uncontrolled passage of other pilgrims from the infected districts, viz., the outbreak of cholera in the Sinope Lazaretto, the occurrence of cases is Constantinople itself, and the later extension to neighbouring villages, the mortality from cholera which took place on ships already passed through the Lazarettos of Sinope and Kavak, and the final outbreak at Yambo, Jedda, and Mecca, terminating in a vast infection of all the holy places and pilgrim routes in the Hedjaz.

" It is clear therefore that Egypt must take all possible precautions to protect its own shores in the first place, and secondly, to prepare to deal with an outbreak in the event of the infection reaching this country. In view of the continued existence, and possible extension of the disease in the neighbourhood of Constantinople, and the approaching return of the pilgrims, no time should be lost in preparing the necessary measures, certain of which it has been already found possible to put into operation.

A.—*Preventive measures.*

" In addition to what is done by the Quarantine Board in accordance with their powers under the convention of Paris, the measures deemed necessary for protecting the country so far as is possible, against the invasion of cholera, are :—

"1. Co-operation with the Quarantine Board for the purpose of:—

"(*a*) Control of possibly infected pilgrims arriving from the region of the Black Sea. This has already been done by resolution of the Quarantine Board, on October 1st, on the proposition of the Ministry of the Interior.*

"(*b*) Control of possibly infected ordinary passengers arriving from similar districts and submitting them within the country to a system of sanitary surveillance. This measure has been much delayed, owing to legal and administrative difficulties, but it is hoped that it will shortly be in operation.†

"2. Protection of the land routes in the Sinai Peninsula, along which many of the pilgrims annually travel in their return northward and westward. These are in control of the War Office, and arrangements have already been made through the Sudan Agent for the protection of the wells, the erection of enclosures for detaining travellers, and the provision of medical stations at El Arish and Nakhl, the former already existing, and the latter to be established by a Medical Officer of the Quarantine Board.

"3. Protection of the land routes in the immediate neighbourhood of the Suez Canal, those on the western border of the Sinai Peninsula south of Suez, those verging on the west coast of the Red Sea from Suez southwards to the 22nd parallel, N. latitude. The most important points in this very extensive line are the neighbourhoods of Gebel Galala, Bir Abu Shaar, the coast line between Ras Abu Suir and Kosseir, Ras Uria and Mersa Halaib.

"These roads are all in charge of the Coast Guard Administration, who have made very extensive and detailed arrangements for their patrolling which should be effective.‡ An inner line of patrols is also to be established in the desert by the Upper Egypt Camel Police.

"4. Protection of the land routes in the Eastern Soudan, i.e., the country south of the 22nd parallel, as far as the Italian frontier. This is being carried out by the Sudan Government whose attention has been specially directed to the importance of the neighbourhood of Roweiya.

"In the event of the cholera finding its way into the Eastern Sudan, it is probable that it would ultimately reach the valley of the Upper Nile, in which case special arrangements would be necessary for the protection of the southern frontier of Egypt. The details of this scheme, however, need not be discussed at present.

"Further, an arrangement with the War Office has been made for the provision of a battalion of Infantry, which will be held in readiness for the purpose of forming a "cordon" in the event of conditions arising in which such "cordon" might be advisable. It is, however, not very probable that these conditions will arise, but inasmuch as rapidity of action is the key of the situation created by such conditions, it is essential that preparation should be made, and the battalion ready to move at a few hours' notice. It is possible also that additional force, beyond the present resources of the police, may be required for guarding the water supply in large towns, and under these circumstances, it should be possible to employ this battalion.

---

* The measure was very shortly afterwards put into operation by the institution of the Departmental Port Service already referred to.

† Appendices giving detailed information maps, diagrams and instruction on the particular matter referred to in each of the above paragraphs were attached to this Note, but for reasons of economy of space, it is not considered necessary to reproduce them in this report.

‡ The patrolling was in fact very effectively carried out by the Coast Guard Administration, for no single pilgrim or passenger reached the Nile Valley by these routes, which are so commonly followed by pilgrims returning to Upper Egypt.

" The foregoing refers solely to the precautions which are being taken, and which are to be taken, having for their object the reduction of the risk of the infection being brought into the country.

B.—*Measures of preparation.*

" A second series of precautionary measures are necessary, even before the outbreak of an epidemic, for the purpose of instructing the public, and ensuring that they, the medical profession, the Government Services, and certain public bodies, shall be sufficiently prepared in the event of an outbreak of the disease occurring. These measures may be described as follows :—

" 1. Circulars and pamphlets to be issued to the public, describing the precautions to be taken to avoid personal infection, to prevent the spreading of the disease, the insisting on the necessity of immediate information being given to the authorities by any person having knowledge of the occurrence of a case of cholera. For this purpose, very considerable rewards should be offered for early information of first cases. *

" 2. The medical profession will be notified by circular of the desirability of co-operating with the Public Health Department and assisting the Government, by giving early information of the occurrence of any suspicious cases.

" Hospitals of the various national and religious communities will also be asked to provide hospital accommodation for those of their community who may desire hospital treatment, or who cannot be effectually isolated and cared for in their own homes.

" 3. The Government Services as a whole will be furnished with general instructions regarding the personal precautions and the necessity of keeping careful touch and control of all employees, in particular :—

" (*a*) The Police will receive special instructions concerning cholera work in large towns, e.g., guarding the water-supply, registration of water-carriers, control of sheikhs el hawaret,

" (*b*) The Prisons Department will be asked to carry out a sanitary survey of all prisons, and formulate plans for avoiding, as far as possible, the introduction of the disease from without, and the dealing with it in case of its breaking out in a prison. Special measures will be required for the sanitary control of the staff, for supervision of the water-supply, the food and the cooking.

" (*c*) The Education Department will be requested to formulate plans for similar sanitary surveys of their schools, for the regime to be established in the event of cholera breaking out in the district in which a school is situated, or even in the school itself. This is a question which requires very careful study, for the interests of educational policy, of the pupils, and of the parents, are not all on the side either of closing the schools or of leaving them open.

" (*d*) The Railway Department has been requested to put forward proposals (i) for dealing with the very large number of their employees ; (ii) in the interests of the travelling public, for providing emergency equipment and ambulances on certain of their trains, and (iii) for the establishment of first aid stations at some of their large towns and junctions.

" (*e*) The Water Engineer of the High Commission has been instructed to make a study of all towns (except Cairo and Alexandria) which are furnished with a regular water supply,

---

* A secret service fund was subsequently granted for this purpose.

and to formulate plans and proposals for erecting additional stand-pipes, and increasing the supply as far as is necessary and possible.

"(*f*) The Municipality of Alexandria has been asked to forward its proposals for dealing with an outbreak, in the event of (*a*) the country becoming infected, and (*b*) the infection extending to, or arising in Alexandria itself.

"(*g*) The Cairo Water Company has been requested to study proposals for extending the delivery of well water, for safeguarding the filters at Abbassia, and for improving the intake at Kasr el Nil, by carrying it out into mid-stream. In this connection it will be necessary for the authorities of the Army of Occupation to take such measures as may be required to avoid discharge of drainage or waste water into the Nile at Kasr el Nil barracks.

"(*h*) The filter installation at Giza has been carefully inspected, and suggestions for ensuring the efficiency of the filters, and the careful supervision of the staff employed, are about to be forwarded to the Public Works Ministry.

"(*i*) The Cairo Governorate and the Public Works Ministry, have been approached with a view of effecting some control over Nile traffic in Cairo waters. It is probable that a North and South Station will be required, with a police patrol and medical post at each, furnished with the necessary river launch, and other equipment.

"(*j*) The Public Health Department is preparing a reserve of Abyssinian pumps, and has entered into a contract with an engineering firm for the purpose of putting down a large number of tube wells, as occasion may arise ; it has also prepared models and materials for the rapid provision of public water supplies in towns and villages which offer the natural facilities for this supply. The Department is also making arrangements for an extensive supply of water utensils to be used in replacing those removed from infected houses. A contract has also been made for the supply of disinfectants, and the necessary drugs and appliances as they may be required. Preparation of equipment for 2,000 beds is in course of completion. A supply of cholera serum is being arranged for.

"It is, however, in the matter of preparing a personnel apt and sufficient for dealing with a great epidemic that this Department feels the greatest possible concern. The existing staff of Inspectors, Medical Officers, Ambulance Attendants, and Disinfectors is far from being sufficient for the strain and duties of supervision that will fall upon them in the event of the country becoming the victim of a serious epidemic.

"Disinfectors can be trained in a comparatively short time ; hospital attendants can be taught the elements of their duty in a somewhat longer period, and efforts will be made to create a reserve of these men as soon as possible, either by drafting from the army reserve, or by local recruiting in the Mudiria hospitals, but the difficulty still remains in filling the higher ranks with efficient recruits. The establishment of the Department is barely sufficient for the effective performance of its ordinary functions, and therefore when a sudden emergency of the magnitude and severity of a cholera epidemic arises there must inevitably be much dislocation of duties, because every individual is called upon to take his share in the greater undertaking. This is unavoidable and is not specially to be deprecated, but there always arises at the same time the great need of stricter and more efficient supervision, and for the exercise of influence on native thought, opinion and action. This is perhaps the most important function of Government in time of epidemic, and for this reason it is regarded as infinitely important that a certain number of the best, most energetic and sympathetic British officials of the various Departments of State should be placed at the disposal of this Department.

"There is no great mystery attached to carrying out cholera regulations, and a highly scientific training is by no means necessary for such work. Infinitely better results can be obtained by a young Inspector, who knows the language, the country, its people, and their customs and peculiarities, and who is known by them and has their confidence, than by many highly trained physicians, knowing nothing either of the language, the people, or their requirements; the object to be held in view is the *prevention* of the disease, rather than its treatment in individuals, i.e., *the keeping within reasonable limits of the numbers* who may ultimately require the treatment of the physician; for if this be not done, no conceivable increase of the medical staff could either assuage the suffering or appreciably reduce the great mortality which must ultimately occur if preventive measures are not carefully prepared, organized and supervised and thus rendered effective.

"The question becomes a national one, and is no longer a purely departmental one, and for that reason, all Departments of the Government should lend their best officials for the purpose of dealing with it. In this way a staff of Inspectors could be recruited from the Ministry of the Interior, the Police, Public Works, Coast Guards, Finance, Survey, and it is also thought from amongst the provincial employees of the Agricultural Bank. A list of these officials proposed for this purpose has been prepared, and if sanction is ultimately given for their employment, measures would be immediately taken to allot them to districts, and to instruct them in their duties pending the occasion which may determine their actual employment.

"The completion of these proposals should place the Government in a fairly favourable position for dealing with the outbreak, if in the end it should occur.

C.—*Active cholera measures.*

"This event would then have the result of putting into force all the active measures which the Department would be prepared to render effective, the details of which it is not necessary here to enter upon, but which are included in the book of "Instructions on cholera" published by the Department in 1906, and which is now in course of revision."

(ii) Pilgrims and the pilgrimage.

The following are extracts from Dr. Creswell's Report on the pilgrimage for the season 1909–1910.

"*Résumé of figures.*

Departure:	Embarked at Suez	9,577	Egyptian	pilgrims
	" " "	4,485	Foreign	"
	Passed through the Canal...	9,876	"	"
	Total	23,938	"	"
Return:	Disembarked at Suez...	9,674	Egyptian	pilgrims
	" " " ... ... *	9	Foreign	"
	Passed through the Canal...	7,039	"	"
	Total	16.722 *	"	"

"Of the returned pilgrims, the 9 foreign pilgrims include five sent to the Suez hospital from Tor.

* The reason for this deficiency lies in the fact that large numbers returned by routes other than Suez.

"The returned Egyptian pilgrims include 757 who left via Syria, 57 via Kosseir, and 72 who said they were Egyptians who had been residing in the Hedjaz.

"The sick returns are as follows :—

	Entered.	Died.
Tor Hospital	281	28
Suez Hospital	27	3
In their homes after return		6

"The statistics of both hospitals may be taken as one, as the more chronic cases were sent in the ship's hospital to Suez hospital ; at Suez the cases were allowed to go home, if not infectious, as soon as suitable arrangements could be made for their transport.

"Four pilgrims were found using the passports of others who were known to have died in the Hedjaz. It is yet too early to arrive at even an approximate idea of how many pilgrims died at the Hedjaz or how many are yet to return. This can only be done about three months after the pilgrimage is over by going through the nominal rolls of out-going and returning pilgrims, and obtaining from the District Inspectors particulars of those not yet shown as having returned.

"89 pilgrims are known to have landed at Suez after having accomplished the Mecca pilgrimage and again embarked for Medina via the Hedjaz railway before returning to their villages. It would be interesting to know what quarantine or disinfection they underwent during the second half of their pilgrimage.

"*Out-going pilgrimage.*—Arrangements and regulations were made for the pilgrims by the Ministry of Interior ; the chief difference in these regulations, as compared with former years being that the principle of one pilgrim one passport was abandoned, and a return was made to the old system of putting the names of a whole family on the back of the passport of the head of the family, and omitting all indentifying distinctions ; a system, that we at the ports have shown rendered the control of the returning pilgrims difficult.

"The embarkation of the pilgrims took place without delay at the new embarking place.

"If there is plague in Egypt the pilgrims are disinfected by the Quarantine Service before leaving Egyptian waters. This is done either at Suez before embarking, or at Moses' Wells or Tor after embarkation. If at the two latter places, the ship takes a day longer in transit to Djeddah, and greater expense is incurred by the Quarantine Administration, so the tendency was to carry out disinfection at Suez rather than at Tor, as disinfection was difficult at Suez, and in order to avoid the necessity of disinfection at Tor a large disinfecting plant has been erected by the Quarantine Administration adjacent to the pilgrim buildings. This station is not yet in operation.

"It happened that one ship-load underwent disinfection one day, a second ship-load the next day did not undergo disinfection, and a third ship the third day was again disinfected. This was strictly in accordance with the provisions of the Paris Convention, but it seems to emphasize the fact that some latitude of discretion should be felt to local authorities.

"The Mahmal and Khedivial caravans were got off without difficulty. The nominal roll of persons accompanying the Khedivial caravan was very carefully made out and exact, but the Mahmal caravan list was not so exact.

"The ships of the Khedivial Company were regularly inspected, and all left in accordance with the regulations.

"*Return of pilgrims.*—Railway arrangements. This year the arrangements were made between the Governor and the railway authorities, the former informing me of the arrangements he had made.

"The principal difference from last year was that the pilgrims entrained at Suez station, as of old, to which place they went by cart, carriage and on foot, instead of at the railway siding at the disembarking place at Port Tewfick.

"The entraining at Port Tewfick gave rise to complaints by the towns people that their trade was interfered with, and the pilgrims themselves appeared to prefer the well-known way of going to Suez crowded on carts.

"The actual disembarkation was quickly done. The order of events carried out at the new buildings is :—

"All sick in a ship's hospital are visited and landed after the number is compared with the list of sick handed in from the Tor authorities. The sick are for the time being kept in sick quarters on shore. Next the first class passengers are landed, after them the pilgrims ; they pass direct to the entrance of the building where the Principal Medical Officer sees them. If they are healthy they pass to the right into the main shed, where the pass port number is checked with lists prepared at Tor. At the other end of the main shed they recover their luggage which has meantime been taken off the ship by another gang-way and put into a shed adjoining the main shed, where the Customs clearance is done. In this way 600 or more can pass out in an hour.

"1. Those who look ill are drafted into rooms on the left where the Assistant Medical Officer and Hakeema take pulse, temperature, and respiration, and thoroughly examine each case. The number so dealt with varies with different ships, but is about 6 to 12 per cent. of the whole ship-load. Those so detained are divided into 3 classes for the Principal Medical Officer to see again and dispose of. Those not really sick are allowed to rejoin their friends.

"2. The sick with ordinary disease, when it is possible to allow them, proceed in charge of their friends. Among these it is usually possible to send on some of the sick transferred from Tor hospital.

"3. Those to be sent to the hospital. These include infectious cases, those seriously ill and those not so ill but who have no friends or money and for whom arrangements have to be made for their transfer home.

"This year the number taken to hospital was less than usual, partly because the congestion at Tor was very much less than in former years owing to so few foreign pilgrims returning that way (14,361 went out by sea, and only 7,045 returned that way), so that more attention was paid to Egyptians and more were put into hospital under observation at Tor, so that nearly all the diagnoses were made there, and partly because there was remarkably little dysentery and chronic diarrhœa.

"In cholera years diarrhœa cases are very difficult to deal with. Their numbers preclude them all being kept in hospital and the uncertainty of the clinical and bacteriological diagnosis of cholera makes it dangerous to let these cases go. The only alternative is for the medical supervision of these cases after their return home to be very real and very strict. The names of all sick pilgrims sent to their homes are notified to the Public Health Inspector of the district by special letter.

"After all the pilgrims have left the ship the crew is inspected and then a gang of workmen is put on board to clean up the rubbish, after which the ship is washed down with sublimate.

"If it is intended to continue the inspection of pilgrims, the present measures are inadequate owing to the opening up of new routes ; for besides the Kosseir and Sinai routes

taken principally to avoid quarantine, there are the Suakin and Syrian routes. The latter especially has given rise to difficulty, and it has been possible to avoid the measures laid down for those pilgrims by the Quarantine Service ; the number returning that way is not known yet, but from tables attached to this report, is evidently increasing.

"In the game of hide-and-seek which we annually play with the pilgrims, it is well to recognize that they have the advantage of position. Any ill-advised measure which they do not like always fails, and it is to our advantage to meet their wishes in every way we can.

"The key to the control after their return is proper registration before they leave. The present system, which enables pilgrims to book their return tickets at their villages when getting their passports has been very successful, and has I believe greatly contributed to the popularity of the Khedivial Mail route. I would suggest that this system be extended so that they could purchase circular tickets according to the routes they wished to take. This, I am told by experts, is quite feasible. Were circular tickets issued returning pilgrims could be identified at all Egyptian ports.

"Another matter of importance is to re-establish passenger control at the port. Cholera does not send a printed notice of its intended outbreak, or of the route which it is going to take. What would have been our position this year, if cholera and not plague had broken out at Djeddah, as the pilgrims were leaving for Egypt, some via Suez, some via Suakin, and some via Medina and the Hedjaz railway to the Mediterranean ports ? The experience of 1908 showed that it takes some months to teach the persons in charge of the ports their work and the faculty of dealing tactfully with passengers so that they may suffer no unnecessary inconvenience."

The following tables Nos. XXII, XXIII, XXIV and XXV, give statistics of some interest connected with the pilgrimage :—

TABLE XXII.

STATISTICS OF THE EGYPTIAN AND FOREIGN PILGRIMS WHO LEFT SUEZ FOR THE HEDJAZ.

Date of departure.	Name of ships.	Pilgrims.		Total.
		Egyptians.	Foreigners.	
August 2 ...	Missir	...	2	2
„ 9 ...	Neghileh	...	4	4
„ 14 ...	Yaroslow	...	5	5
„ 16 ...	Mahallah	...	28	28
„ 23 ...	Neghileh	...	222	222
„ 30 ...	Tanta	4	119	123
September 5 ...	Vladimir	...	42	42
„ 6 ...	Missir	6	360	366
„ 13 ...	Neghileh	6	61	67
„ 20 ...	Missir	...	90	90
„ 27 ...	Mahallah	4	17	21
October 4 ...	Rahmanieh	...	18	18
„ 11 ...	Missir	2	22	24
„ 18 ...	Qualioubieh	5	16	21
„ 25 ...	Neghileh	208	85	293
„ 29 ...	Kostroma	...	13	13
November 1 ...	Rahmanieh	157	223	380
„ 8 ...	Mahallah	233	161	394
	Carried over ...	725	1,488	2,213

STATISTICS OF THE EGYPTIAN AND FOREIGN PILGRIMS WHO LEFT SUEZ FOR THE HEDJAZ—*continued.*

Date of Departure.	Name of ships.	Pilgrims.		Total.
		Egyptians.	Foreigners.	
	Brought forward...	725	1,488	2,213
November 12 ...	Missir	125	335	460
„ 15 ...	Qualioubieh	...	74	74
„ 18 ...	Rahmanieh	531	215	646
„ 19 ...	Glaxidon	3	111	114
„ 20 ...	Mansourah	438	285	723
„ 22 ...	Missir	362	160	522
„ 23 ...	Keneh	759	90	849
„ 25 ...	Neghileh	420	104	524
„ 26 ...	Tanta...	804	197	1,001
„ 27 ...	Rahmanieh	578	86	664
„ 29 ...	Mariout	778	77	855
„ 29 ...	Qualioubieh	...	134	134
„ 30 ...	Menzaleh	766	67	833
„ 30 ...	Kief	...	65	65
December 1 ...	Mansourah	726	3	729
„ 3 ...	Keneh	658	166	824
„ 6 ...	Neghileh	493	...	493
„ 6 ...	Minieh	1	212	213
„ 7 ...	Assouan (Mahmal)	1,049	...	1,049
„ 8 ...	Prince Abbas	91	4	95
„ 8 ...	Hodeidah	1	319	320
„ 10 ...	Mariout	311	139	450
„ 11 ...	Kherson	...	28	28
„ 12 ...	Mahroussa (H.H. the Khedive)	81	...	81
„ 13 ...	Rahmanieh	72	102	174
„ 15 ...	Qualioubieh	5	24	29
	TOTAL... ...	9,577	4,485	14,062

N.B.—Include in the Egyptian pilgrims, 261 children.
„ „ Foreign „ 72 „

TABLE XXIII.

STATISTICS OF THE FOREIGN PILGRIMS PASSING THROUGH THE CANAL FOR THE HEDJAZ, 1909.

Date of departure.	Name of ship.	No. of Foreigners.	Remarks.
Aug. 14	Yaroslow ...	175	Russian ship.
Sept. 5	Vladimir ...	168	„ „
„ 14	Nijni of Grod..	80	„ „
Oct. 29	Castroma ...	258	„ „
Nov. 6	Sisilia	41	German „
„ 7	Dunic	300	English „
„ 10	Abdel Kadir...	85	Ottoman „
„ 12	Menzaleh ...	725	K. M. L. „
„ 17	Euphrate ...	392	Russian „
„ 19	Glaxidon ...	484	Greek „
„ 22	Zaritza	951	Russian „
„ 28	Adalat	330	Ottoman „
„ 28	Assouan ...	1,280	K. M. L. „
„ 30	Kief	1,098	Russian „
Dec. 6	Minieh	783	K. M. L. „
„ 7	Tigre	910	Russian „
„ 10	Hilal	496	Ottoman „
„ 11	Kherson ...	274	Russian „
„ 11	Foronij	610	„ „
„ 12	Massilia ...	466	French „
		9,876	

TABLE XXIV.

STATISTICS OF FOREIGN PILGRIMS PASSING THROUGH THE CANAL ON RETURN FROM THE HEDJAZ, 1909.

Date of arrival.	Name of ship.	No. of Foreigners.	Remarks.
Jan. 16	Tigre	888	Russian ship.
„ 17	Assouan ...	1,080	K. M. L. „
„ 19	Hodaidah ...	811	Ottoman „
„ 20	Kherson ...	781	Russian „
„ 22	Konia	593	Ottoman „
„ 22	Zaritza	339	Russian „
Mar. 4	Glaxidon ...	501	Greek „
„ 7	Massilia ...	1,535	French „
„ 18	El Hilal ...	511	Ottoman „
		7,039	

TABLE XXV.

Statistics of the Egyptian Pilgrimage (from 1900 to 1909 inclusive).

YEAR.	Governorates.						Lower Egypt Mudirias.						Upper Egypt Mudirias.								TOTALS.
	Cairo.	Alexandria.	Port Said.	Suez.	Ismailia.	Damietta.	Dakahlia.	Gharbia.	Sharkia.	Behera.	Menufia.	Kalioubia.	Giza.	Fayum.	Beni Suef.	Minia.	Girga.	Assiut.	Kena.	Aswan.	
1900	1,026	337	35	20	...	116	904	1,129	642	723	650	254	168	224	137	157	168	222	45	69	7,026
%	(14)	(4)	(1)	(1)	...	(2)	(13)	(16)	(9)	(10)	(9)	(4)	(2)	(3)	(2)	(2)	(3)	(3)	(1)	(1)	
1901	899	245	27	29	...	56	1,056	1,093	664	703	328	163	197	113	44	137	87	229	45	69	6,128
%	(15)	(4)	(1)	(1)	...	(1)	(17)	(17)	(10)	(11)	(5)	(3)	(3)	(2)	(1)	(2)	(1)	(4)	(1)	(1)	
1902	803	286	24	16	...	53	628	1,269	416	585	314	164	279	108	102	200	169	323	54	34	5,830
%	(14)	(5)	(1)	(1)	...	(1)	(11)	(22)	(7)	(10)	(5)	(2)	(4)	(2)	(2)	(3)	(3)	(5)	(1)	(1)	
1903	355	39	...	7	...	...	6	25	5	...	...	3	2	...	...	...	...	1	...	...	443
%	(80)	(9)	...	(2)	...	...	(1)	(6)	(1)	...	...	(05)	(03)	...	...	...	...	(02)	...	...	
1904	1,180	481	30	12	3	113	1,920	2,010	1,149	558	1,405	545	707	554	762	1,076	403	1,131	178	72	14,289
%	(8)	(3)	(1)	(05)	(05)	(1)	(12)	(14)	(8)	(4)	(10)	(4)	(5)	(4)	(5)	(7)	(3)	(8)	(1)	(1)	
1905	1,199	659	26	29	4	102	1,044	1,314	687	614	1,208	434	543	335	412	597	983	912	294	78	11,480
%	(10)	(6)	(04)	(05)	(01)	(1)	(9)	(11)	(6)	(5)	(11)	(4)	(5)	(3)	(3)	(5)	(9)	(8)	(2)	(1)	
1906	1,527	954	74	30	15	...	2,634	2,560	1,586	1,459	1,632	748	836	524	544	835	889	643	384	76	17,971
%	(9)	(5)	(04)	(01)	(01)	...	(15)	(14)	(9)	(8)	(9)	(4)	(5)	(3)	(3)	(5)	(5)	(3)	(2)	(04)	
1907	1,775	744	42	18	...	...	2,160	2,006	999	1,323	1,360	501	934	605	939	911	479	842	166	66	15,870
%	(11)	(5)	(04)	(01)	...	...	(13)	(13)	(6)	(9)	(8)	(3)	(6)	(4)	(6)	(6)	(3)	(5)	(1)	(05)	
1908	971	572	52	7	4	...	430	636	349	336	355	131	246	229	267	247	440	506	112	25	5,915
%	(16)	(9)	(1)	(02)	(01)	...	(7)	(11)	(6)	(6)	(6)	(2)	(4)	(4)	(5)	(4)	(8)	(8)	(2)	(07)	
1909	2,008	404	82	52	15	159	740	1,064	534	385	369	213	641	334	613	645	331	582	133	73	9,577
%	(21)	(4)	(1)	(07)	(03)	(2)	(8)	(10)	(6)	(4)	(6)	(2)	(7)	(3)	(6)	(7)	(3)	(6)	(2)	(1)	

NOTE :—1903. The number of pilgrims this year is considerably reduced on account of the Government having compelled all pilgrims to make a deposit of L E. 50.

D.—GENERAL SANITARY MEASURES.

(i) Birkets.

The stagnant pools and marshes which are found on the outskirts of nearly every village in Egypt have long been marked down as one of the blots on the sanitary condition of the country. It is certain they afford a breeding ground and a refuge for many of the protozoan parasites of man and animals, of worms, insects and other forms of lower life inimical to the health and welfare of the community. The pious opinion so frequently registered in favour of their gradual effacement has been sanctioned by long tradition, but although a considerable step has been taken both by this Department and the State Lands Department towards filling up some of the worst, the impression up to the present time on the whole evil cannot be anything but infinitesimal.

It is true that a law exists which aims at the prevention of the excavations which lead to these " birkets " and their compulsory filling in where they exist, but the administrative difficulties in the way of applying the law are frequently such as to render it inoperative.

Many birkets are the property of the Government, and in a considerable proportion of cases have been created by Government Administrations more particularly in the course of railway construction and maintenance.

A large proportion of the worst birkets are found in borrow pits excavated in order to obtain ballast for the building up of the railway banks. The explanation and excuse for this action since it is the cheapest method of obtaining the required material, naturally resolves themselves into a question of finances; but when Government is able to devote funds to the avoidance of these inconveniences it will be less difficult to apply the law in the case of private individuals.

The amelioration of the existing " birket " condition would appear to be one in which activity on the part of the newly constituted Provincial Councils might be exercized with reason and advantage.

If the Government would make a trial in one or two selected provinces of handing over Government birkets to the Provincial Councils on the condition that they devoted a certain proportion of their annual revenue to the filling up of these birkets, not only would a good work of sanitation be effected, but if the selection of birkets were judiciously made, the proceeds of the reclaimed land might afford either additional revenue in the future, or the commencement of a reserve fund which would in time be available for capital expenditure in other works of public utility.

During the year 1909 the filling (begun in 1908) of the large birkets in the centre of the town of Manfalut was completed by this Department; a cube of 23,975 metres being filled in at a cost of L.E. 2,122; the increased value of the ground should balance this expenditure.

The State Land Administration filled up 92 birkets in 1909, against 144 in 1908. No record exists of the cube of this work.

(ii) Mosques and public baths.

The sanitation of the ablutionary and latrine installations of Mosques and the general design and sanitation of public baths is of considerable importance in this country, more

particularly with reference to water-borne disease. It is essential therefore that these installations should be in accordance with public health requirements and that in emergency they should be immediately under control of this Department.

A new law on the subject, effecting considerable amendments and improvements on the old law, is now before the Legislative Council, and if enacted will carry the administration a considerable step further in the power of control over the establishments in question.

The number of plans submitted, amended, and finally approved in 1909 were :—

Wakf's mosques*	32
Private mosques	17
Public baths	5
Total	54

(iii) Cemeteries.

The status of cemeteries and their management is far from satisfactory, and an enquiry is now being carried on with regard to the best method of dealing with the whole question, for it is certain that conditions obtain under which abuses exist and are rendered possible.

It will be more expedient to postpone discussion in detail of the enquiry until it is completed and final propositions are framed for presentation to the Government, but meanwhile it may be said that delimitation is the first essential, and on this line certain progress has already been made.

This measure has been carried out by the Department during 1909 in 209 cemeteries, viz. :—

In the Province of	Sharkia	104	
	Dakahlia	21	
	Menufia	3	
	Gharbia	29	
	Behera	1	
	Qaliubia	10	
	Keneh	3	
	Minia	1	
	Fayum	26	
	Giza	8	
and Governorate of	Port Said	1	(enlargement).
	Suez	1	(boundary wall).
	Total	209	

An interesting and important point in connection with the conversion of basin irrigation in Middle Egypt into the perennial type may here be noted. The process would appear to have resulted in the raising of the general level of the subsoil water and a certain few cemeteries have thereby become water-logged. Translation in these cases will be necessary, and in view of the cause it must be admitted that the cost of the translation is a fair charge to Government.

---

* Wakf's mosques are those that are under the jurisdiction and management of the Wakfs Department and are usually the subject of endowments by deceased persons whose estates are partially or wholly administered by the said Department.

(iv) Unhealthy Establishments.

It will be recollected that a Committee presided over by Coles Pasha, C.M.G., was appointed in the autumn of 1907 to consider the law and its administration as applied to "Etablissements Insalubres" and "Etablissements Publics."

The evidence of almost all witnesses examined condemned the cumbrous and complicated mechanism which is embodied in the Decree regarding "Etablissements Insalubres, Incommodes et Dangereux."

The radical fault of this law is that it endeavours to regulate by a single instrument matters of the most diverse nature; it attempts to provide for the avoidance of insanitary public nuisance by the same mechanism that is designed to secure the owner and the public against fire; the safety and health of the workers in an industrial establishment are sought by the same method as fouling of the water supply is to be prevented; the purity of alimentary products is aimed at by the same administrative process as should secure the neighbours against the nuisance of noise caused by workers in metal or the repeated explosion of a badly regulated oil engine.

If to these conditions be added the fact that the local sanitary authorities were not adequate in numbers, special training, or experience for the work imposed on them, it is remarkable that any good result should have been obtained; and yet in certain places, where the local authorities were more than usually competent, administrative common sense triumphed over cumbrous legislation and produced a not discreditable result.

Certain changes in the administration of the law have recently been made, but it is impossible to say that experience has as yet shown that these changes have contributed either to simplicity or efficiency. In an analysis of an inspection which was ordered in a certain typical markaz, out of a total of 191 establishments inspected only about one-third (66) made any pretence of complying with the letter of the regulations while practical realization of the conditions required scarcely existed at all.

It is satisfactory, however, to be able to state that a small working committee representing the various interests concerned is now engaged on the drafting of definite proposals for the replacement of the condemned law by other provisions which it is hoped will be more adapted to the realization of the end in view.

(v) Fairs and Markets.

Fairs (mulids) are a great feature of Egyptian provincial life. As is well known they are usually connected with the memory or traditions of a long past holy man or saint (sheikh) and in theory partake somewhat of a religious character.

The chief interest from the point of view of public health is naturally the conditions produced by a vast aggregation of people (at the Tanta and Dessuk Mulids the number commonly reaches or even surpasses 100,000) both from the situation created by an unusual concentration of even a healthy population and also from the risk of the presence of carriers of infectious disease amongst the crowded frequenters of the fair.

It will be realized therefore that, in a country where plague is admittedly approaching the endemic condition, where small-pox, typhus and other infectious diseases are prevalent, and where exposure of the sick is little considered, these mulids are likely to be a fertile

cause of the communication of disease. Yet at the same time it is both inadvisable and impossible to prohibit them except in very special cases such as the presence of cholera in the country, the prevalence in the district of pneumonic plague or the existence of any virulent outbreak at the seat itself of the fair.

Sanitary precautions may, however, be taken and in some cases (notably at Tanta) have been developed on very sound and efficient lines so that the mass of people are kept well away from the town itself, the site of the fair is laid out in the form of an organized camp, water supply is provided, and a corps of conservancy men attend to the sanitary service of the area. Under these conditions little harm results and decency and order are maintained.

E.—MUNICIPALITIES AND LOCAL COMMISSIONS.

The institution of these local bodies has been of the deepest interest to this Department, for it must be recognized that in accordance with the fundamental and wider views of State hygiene the underlying motive of municipal government is the securing of conditions in a closely aggregated community which shall, as much as possible, mitigate the drawbacks of overcrowding and pressure inseparable from town life as contrasted with the more tranquil life of the country ; for in the towns as compared with the country, the question of water supply, drainage, conservancy, control of infectious disease, means of transport, open spaces and urban ventilation assume increased importance and become greater proportional factors in the conditions of life of the community.

It is therefore both natural and necessary that the State health authority should be closely interested in general municipal administration and, inasmuch as the methods pursued will naturally react on the State as a whole, it must be indued with adequate control in regard to the sanitary legislation and administration which the local bodies propose and actually do put into execution. Problems are many and difficult, not the least of which is the provision of the necessary funds. Powers of raising money by voluntary taxation are, however, being gradually extended by the institution of Mixed Commissions, and if these local bodies will use the powers conferred upon them it is probable that considerably larger revenues will be realized.

It should be explained that the Municipalities differ from Local Commissions in two important particulars ; the former include a certain proportion of elected European members and are endued with wider powers, amongst these the power of levying certain local taxes ; the Local Commissions are exclusively Egyptian and have no resources other than a Government subsidy or the revenue derived from certain municipal institutions such as the provision of water, light, etc.

The following tables detail in a tabular form the existing Municipalities and Local Commissions, together with their budgetary appropriation. It must not be supposed, however that the amounts shown under the Sanitation Chapter represent the whole of the work done in the interest of hygiene, it will readily be understood that much of the other expenditure is equally of hygienic value in its broader sense.

TABLE XXVI.

Municipalities.

Municipalities.	Water.		Light.		Central Office.		Roads.		Sanitary works.		Lands for Tanzim.	
	L.E.	M.	L.E.	M.	L.E.	M.	L.E.	M.	L.E.	M.	L.E.	M.
Mansura ...	8,500	...	1,640	...	2,814	...	3,440	...	350	...	2,750	...
Zagazig	3,500	...	1,547	...	1,108	...	3,909	...	265	600	500	...
Tanta	600	...	1,800	...	823	...	4,447	400	306	...	1,000	...
Damanhur ...	12	...	1,827	...	504	...	3,467	...	50	...	400	...
Beni Suef ...	353	...	1,100	...	683	...	2,180	200	18	...	50	...
Fayum	200	...	1,811	...	657	...	2.896	...	346	...	449	...

Municipalities.	Vidange.		Street macadamizing.		Fire pumps.		Reserve for unforeseen expenses.		Miscellaneous expenses.		Collecting expenses.	
	L.E.	M.	L.E.	M.	L.E.	M.	L.E.	M.	L.E.	M.	L.E.	M.
Mansura ...	1,000	...	350	...	699	500	8,405	...	...	...	...	...
Zagazig	...	...	...	...	...	...	5,400	...	...	...	621	...
Tanta	...	...	...	...	...	...	...	...	...	...	244	800
Damanhur ...	...	...	...	...	...	...	...	...	...	...	280	...
Beni Suef ...	...	...	...	...	228	...	5,373	...	30	...	348	...
Fayum	...	...	...	...	...	...	292	...	...	...	264	...

TABLE XXVII.

Local Commission.

Budget of Ordinary Expenditure in 1909.

Local Commissions.	Chapt. I. Water.		Chapt. II. Light.		Chapt. III. Roads.		Chapt. IV. Sanitary works.		Chapt. V. Lands taken. for Tanzim.		Chapt. VI. Petty expenses.		Total.	
	L.E.	M.	L.E.	M.	L.E.	M.	L.E.	M.	L.E.	M.	L.E.	M.	L.E.	M.
Rosetta	...	...	378	...	907	...	100	...	15	...	112	...	1,512	...
Suez	450	...	940	...	3,241	200	150	...	50	...	151	...	4,983	200
Damietta ...	1,136	...	520	...	5,235	...	150	...	150	...	240	...	7,431	...
Mataria	25	...	250	...	1,709	...	25	...	250	...	41	...	2,300	...
Dessuk	14	500	368	950	785	900	100	...	...	...	95	...	1,364	350
Zifta	109	...	539	400	1,124	...	100	...	150	...	92	90	2,114	490
Kafr el Zayat	95	400	662	...	813	200	100	...	...	...	102	400	1,773	...
Meh. el Kobra	58	...	403	600	1,162	200	100	...	300	...	167	200	2,191	...
Samannud ...	36	...	240	600	860	800	100	...	200	...	100	...	1,537	400
Sheb. el Kom...	60	...	547	...	1,122	...	100	...	150	...	93	...	2,072	...
Benha	71	...	510	...	1,692	...	100	...	90	...	128	...	2,591	...
Minia el Kamh	53	800	220	...	556	200	50	...	...	...	5	...	885	...
Simbellawein...	60	...	250	...	807	...	50	...	..	...	105	...	1,272	...
Mit Ghamr ...	78	...	462	...	1,253	...	100	...	50	...	153	...	2,096	...
Giza	120	...	600	...	1,216	...	25	...	230	...	142	...	2,333	...
Sennuris ...	...	...	300	...	742	...	100	...	...	...	161	...	1,303	...
Beba	...	...	250	...	549	...	100	...	...	...	25	...	924	...
Minia	248	...	650	...	2,062	...	150	...	94	...	112	...	3,316	...
Assiut	570	...	900	...	2,082	...	160	...	110	...	215	...	4,037	...
Mallawi	144	...	425	...	872	...	...	...	...	...	110	...	1,551	...
Manfalut ...	200	...	440	...	714	...	20	...	...	...	98	...	1,472	...
Abu Tig	130	...	250	...	742	...	80	...	...	...	102	...	1,304	...
Akhmim... ...	84	...	382	875	864	600	75	...	...	...	108	...	1,514	475
Tahta	105	100	386	...	890	450	50	...	20	...	103	450	1,555	...
Girga	115	...	465	...	1,172	700	75	...	50	...	98	...	1,975	700
Sohag	164	886	367	400	1,154	600	100	...	100	...	88	...	1,974	886
Kena	326	...	370	...	1,218	...	100	...	150	...	110	...	2,274	...
Luxor	153	...	240	...	1,572	600	80	...	212	574	100	826	2,359	...
Isna...	67	600	200	...	802	400	50	...	150	...	13	...	1,283	...
Aswan	834	...	443	...	2,006	...	60	...	200	...	83	...	3,626	...
Tala...	50	...	250	...	840	...	20	...	...	...	40	...	1,200	...

F.—GOVERNORATES.

(i) Cairo.

There is as yet no Municipality in Cairo, the City Services being at present assured by the competent Government Departments. A Committee (composed of Mr. A. L. Webb, C.M.G., President, Mr. A. H. Perry, Mr. W. P. G. Graham, Maître Rocca-Serra, Adib pacha, Mahmud Pasha Sidki, and Mustafa Pasha Maher), sat during the winter of 1908–09 and after careful consideration and discussion produced a report and recommendations which are now under consideration of the Government.

(a) *Water supply.*—This important question, which has occupied public attention for some five years, may at last be said to have received a solution which will assure to Cairo City an acceptable supply for some considerable period to come.

It will be remembered that in 1903, when the re-organization of the water supply was under consideration, it was decided to give up the Abbassia filter installation (which was markedly inefficient and out of date) and take water from deep tube wells to be bored in the northern suburbs and near the Nile bank.

This proposal was a very natural following of, and in strict accordance with, one of the most recent schools of European municipal water engineers, which sought to find a source of supply in water pure in origin and by fixed natural circumstances immune from all contamination rather than in the artificial purification of a water impure in origin or open to pollution in its course.

There can be no question that the balance of public and scientific opinion is in favour of a *naturally* pure water supply, other things being equal, rather than of one that owes its purity to artificial means alone.

At the time that the Rod el Farag wells were sunk there had been a general movement in the country in favour of deep tube-wells and water derived from such a source had been used for some considerable time at Tanta and elsewhere without serious complaint. The general impression amongst the public was that a deep tube-well must necessarily give water whose characteristics were those usually associated with the water of true "*artesian*" wells, though reflection would have revealed the fact that owing to the geological formation of the country the water hitherto furnished by the deep wells already put down throughout Egypt could only be infiltration water, and that between the two the difference was considerable as regards both origin and average chemical composition. It did not, however, require a very long period of time for the public to experience disappointment and to find real or imaginary drawbacks in the taste, hardness and other domestic qualities of tube-well water-with the result that complaints began to make themselves heard.

Unfortunately also, experience demonstrated the existence of iron and manganese in quantity favourable to a growth of a black mould (crenothrix) which discoloured the water and any soft material washed in it, and caused deposits in the service pipes to such an extent as in some cases to entirely occlude their lumen.

There is no doubt this condition contributed to the belief in the public mind that the discoloration and the existence of the black matter indicated contamination of the water by sewage, a belief which was, however, absolutely groundless.

In the autumn of 1907 an International Commission * assembled to consider the question.

The result of their deliberation conclusively proved that the water was bacteriologically pure and free from sewage contamination.

The Commission suggested that the Government should study means for removing the manganese and iron, but did not make any specific recommendation on the point which most interested the public, viz., whether the wells were to be maintained as the source of public supply or whether it was desirable to return to the Nile.

The whole question was then again submitted to a Committee † appointed by the Council of Ministers, and extensive experiments were made by the Public Health Department for the removal of the manganese and iron, but though it was considered that an efficient method had been discovered and elaborated, the final verdict was, in virtue of other reasons, unanimously in favour of a return to the Nile.

Meanwhile, a further difficulty had presented itself; for the wells began to give less and less yield as time progressed, for though each well was capable of supplying about 4,500 to 5,000 cubic metres of water per day when first put down this figure soon diminished, and finally many wells were yielding less than half the original output. This decrease of supply was not due to any depletion of the water table (which is practically inexhaustible), but to the incrustation of hard siliceous matter on the metallic gauze of the tubes rendering it less and less porous until the minute spaces are almost entirely occluded by a cement-like matter which it is mechanically impossible to remove.

In view of these facts it is impossible to see how any other solution than that recommended by the Committee could be entertained, for though the manganese and crenothrix could be removed by the pyrolusite process the aversion of the people could not be affected by that or any other process; and when a people have drunk and used the comparatively softer water of the Nile for countless generations it is not difficult to understand their natural prejudice in favour of it; added to which the gradual failure of the yield of water introduced, another problem which would require considerable study, time, and expense to solve.

In the decision to renounce the unpopular and troublesome wells Cairo has been by no means singular, for difficulties similar to those encountered here have already compelled other communities to do likewise, amongst which may be quoted those of Breslau and Berlin; while it is reported that Hamburg is now in process of experimenting on mechanical filters with the same end in view.

It having been decided to return to the Nile the questions of (*a*) intake, and (*b*) filter system, were the next points to be settled.

As regards the intake the matter was beset with complications, for if the well-known axiom of an up-stream intake were to be adhered to it was clear from the first that financial and mechanical difficulties of no mean order would necessarily be encountered. It had

---

* This International Commission consisted of :—
Professor Dr. Gaertner, Director of the Institute of Hygiene at the University of Jena.
Dr. A. C. Houston, B. Sc., etc., Director of Water Examinations, Metropolitan Water Board.
Dr. Dienert, Chef du Service de surveillance des Eaux d'alimentation de Paris.

† This Committee consisted of Mr. A. L. Webb, C.M.G., Advisor to the Ministry of Public Works; Lord Edward Cecil, D.S.O., Under-Secretary of State for Finance; Mr. W. P. G. Graham, Director-General of the Department of Public Health; Anis Pasha, Director of the Technical Services, Ministry of Public Works; and Ibrahim Pasha Hassan, late Director of the Government Medical School.

freely been stated at various times that an intake situated as far as possible to the south of the city must be an essential condition of any scheme involving a Nile origin, the question was, was it necessary to insist on this condition ? Every endeavour would be made to realize it if it were, while if it were not, reasons must naturally be forthcoming for its rejection.

If the problem were being worked out on a "tabula rasa" there would without question have been a disposition to deal with it on the basis of a southern intake, but under existing circumstances such a proposition must involve so large a financial outlay that it became a preliminary necessity to take stock of the situation, and ascertain how far the axiom above-mentioned is logically and practically applicable to the case under examination ; or, in other words, to consider whether in adopting an up-stream intake for Cairo, it would not involve a financial sacrifice entirely disproportionate to the practical advantages assured.

The points to be considered in connection with the source of the raw water for a filtered public supply may be regarded as follows :—

1. The normal chemical and biological condition of the water ;
2. Its liability to variation ;
3. Its liability to specific pollution in emergency.

With reference to these several points it may be said that the conditions of the Nile at Cairo are by no means analogous to those commonly met with in those parts of the world where the principles of modern sanitation have mostly been worked out ; regions where populous towns are seated on the rivers and streams fed by perennial rains and meltings of snow, water courses which, forming the natural drainage of their water-sheds, were long since adapted by man to take on the additional duty of the drainage of their abodes. That is to say that each stream became the main sewer of the towns on its banks, and was undoubtedly thereby contaminated for such a distance below as is required by nature for the processes of self-purification.

The conditions of Cairo are, however, by no means parallel to those just cited. The city does *not* directly drain into the river, but will in a few years be provided with a drainage system which will carry off to a point far distant from the Nile the great proportion of matter from which contamination might be feared.

In addition the Public Works Authorities have given assurance that even where storm overflows exist in the scheme their planning is so arranged that the surface drains will be flushed clear before the weirs come into action, and that there is nothing to fear from contamination in this respect. The degree to which this assurance is carried may be inferred from the fact that the rain storm of April 20th, 1909, which was one of the heaviest known. (25 millimetres in 12 hours), would not, it is stated, have required the storm overflows to carry it off. There is therefore no reason for regarding the City of Cairo itself as a serious source of pollution to the immense volume of the Nile as it flows by.

Again the Nile is not a river subject to frequent variations of its volume as the result of local rain-storms or the seasonal meltings of snows on the one hand, or prolonged drought on the other, but it is subject once annually to an enormous accession of waters, which sweeping through its course for the space of three months, in the manner of a gigantic and long sustained spate, leave in its scoured bed, and behind its dams a huge volume of water which is held in reserve to maintain the summer levels of river and canals.

Also in the season of low water, when the concentration of deleterious contents is at

its maximum, and when according to the axiom the necessity for an up-stream intake would be most imperious in its demands for recognition, the stream in the river is practically non-existent, and the whole body of water becomes an extensive lake reaching many miles to the south of Cairo ; under such circumstances, in what may be called the " critical period " of the Nile flow, it cannot be seriously maintained that an intake at Tura would fulfil the conditions usually associated with the term " up-stream."

So much for the theoretical application of the axiom to the local conditions ; but some doubt might still exist if practical knowledge of the relative degree of purity or impurity of the Nile during the critical season did not exist. This critical season may be said to exist for a varying period (according to the earliness or lateness of flood and the quantity of water in the river bed), between the beginning of May and the last weeks of July or the early days of August.

For the purpose of investigation of the character of the water during this period, a bacterial and chemical (organic) survey of the river above and below Cairo was made during the summer of 1908, and continued in 1909, the observations extending from the beginning of May until the middle of August each year. Samples of water were taken regularly each week from five sites on the Nile, viz. :—

1. Opposite Deir el Teen ;
2. Opposite Giza ;
3. Opposite the pumping station, Kasr el Nil ;
4. Opposite the Water Works, Rod el Farag ;
5. North of Rod el Farag Sahel.

At each of these places three samples were taken, one from mid-stream, and one from half-way between mid-stream and the bank on either side. Two counts were made from each sample and the calculated averages taken as the index. The results failed to show that there was any marked difference in favour of any particular site, though such slight difference as did exist was in favour of the Rod el Farag locality. This after all is not surprising when consideration is given to certain facts already cited, viz., the absence of drainage of domestic or manufacturing establishments, the scanty rainfall, and above all, to the great volume of water which lies in the river bed.

The salient feature in the situation is the fact that provided the spot selected be not near the bank, the normal biological and chemical composition of Nile water compares most favourably with the usual river supply in Europe, both as regards its actual indices, and in the narrowness of the range in which variation of those indices takes place.

The question of the normal composition of the raw water and its liability to seasonal variation has now been discussed ; there remains the important one of liability to specific pollution in emergency ; this refers to the discharge of a dangerous matter (enteric or choleraic) within range of the intake. In the case of the site proposed, it could only take place from a passing boat or steamer, this is a risk, certainly a very remote one—which must exist under any circumstances at any place in the river at which an intake can be placed, and that being so the fact that an intake placed opposite the Water Works could be more readily and securely guarded than elsewhere weighed in favour of this site, while the prospective removal of the navigation to the western branch of the river (Bahr el Aama) will render the intake still more secure from specific contamination.

In any case, however remote the risk, confidence may be maintained in its being completely removed by efficient filtration such as is proposed. The preliminary sedimentation

with sulphate of alumina, the passing of the sedimented water through a mechanical filter (the film deposit of which is analogous to Chamberland-Pasteur or Berkfeld material), and the daily cleaning of the filter by reversal of the current will effectually remove pathogenic germs before they can enter the general circulation ; while the provision of an emergency sterilization plant will afford absolute security in time of cholera.

It will be seen therefore that considerable reliance is placed on the filtration system, and this is entirely in accordance with the best modern practice in connection with such conditions as those with which we are dealing.

In early days, before Simpson invented the slow sand filter, the question of intake was paramount ; but with the recent improvements in filter systems and the advancing recognition of the fact that an intake can in practice never be made absolutely safe, the very sound practice has grown up of perfecting as far as possible the filter system, tending it with the greater care, and placing upon it the greater reliance. In illustration of this contention, the case of Alexandria may be quoted. Before the installation of the present filter system in 1905, the agitation with regard to the intake had been persistent and universal ; the public, the Municipality, the Health Department, and the Company had all urged the removal of the intake to a spot further up the Mahmudia Canal.

Now the normal pollution of the canal is some 4 to 6 times as great as that of the Nile at Cairo, the liability to specific pollution must be some hundreds of times greater, the volume of water is not one-sixtieth part of that of the Nile at Cairo, and yet, since the installation of the present filters, no demand has been heard from the public or from official authorities as to the desirability of removing the intake ; and the character of the filtered water has been beyond reproach.

Expression has been given to the fear that under certain circumstances there might be a risk of a general infection of the water supply. It is well to consider what experience can show as to the soundness or otherwise of this fear.

The so-called water-borne diseases that assume importance in this question are enteric fever and cholera. With regard to the latter it may be said at once that in the history of epidemiology there is of recent years no known case of wholesale infection of a public water supply that has been passed through even the old-fashioned sand filter.

But on the other hand there exists the striking occurrence of the Hamburg and Altona outbreaks, where the rough filtration of water receiving cholera polluted sewage was sufficient to protect Altona from a water-borne cholera epidemic, whereas Hamburg, using the same source of supply unfiltered, suffered to an extreme degree.

In the cholera epidemics of which this country had experience in 1895, 1896 and 1902, when the water intake was at Kasr el Nil, on the bank of the river, and exposed daily to the risks of specific pollution by the presence of boats congregated for the passage of the bridge, when the filters of the Company were rudimentary and inefficient, there was not even a suspicion of a general infection of the water supply ; if therefore a midstream intake be adopted, and the latest and most improved system of filtration installed, it may fairly be claimed that any risk of a general cholera infection can only exist in imagination.

As regards enteric fever, the matter is somewhat different. Cases are on record where an enteric outbreak has been traced to a polluted water supply insufficiently purified by a faulty filter system ; and in these cases where an absolutely safe source, such as deep wells or upland lakes, is not available, the universal practice is to perfect the filter system as far as possible, as giving the greatest degree of security.

A typical case is that of the Lincoln outbreak of a few years ago ; but in this as in other cases, the fault was that of inefficient old-fashioned slow sand-filtration, the conditions of which permitted the filter itself to become infected, and did not allow of faults being detected before the resulting epidemic declared itself. It will be quite otherwise with the system now proposed. The sedimentation will remove the great majority of bacteria. The filter film will complete the work, while the daily washing and reversing of the current will effectually prevent any permanent infection of the filter itself, and remove the risks attendent on slow sand filtration.

Under these circumstances, the Director-General did not feel it justifiable to recommend to the Government a distant intake at a cost of some L.E. 100,000, when it was not apparent that any commensurate advantage would be secured by such an outlay, and therefore he recommended an intake opposite Rod el Farag at 100 metres from the bank with a full sense of the responsibility incurred. This course was the more readily adopted because if the circumstances of the river should change, and conditions arise rendering the removal of the intake advisable it can readily be done at no greater cost than at the present moment, and that probably at a time when money is more readily available than is the case at present.

It may be well here to dispel a rumour which existed to the effect that " surface water " drainage would be diverted into the Nile above the intake ; this is an entirely erroneous supposition. The Public Health Department never has sanctioned and never would sanction such a proceeding, and the Drainage Department has officially and definitely stated that the street washings " will be pumped into the sealed sewage mains, and from thence to the head of the main collector " and will thereby be led to the Sewage Farm at Khanka.

Further, under no circumstances will any domestic sewage enter the Nile. The question is referred to in detail in the succeeding article, but the public may rest assured that no such fouling of the source of their water supply will take place.

As regards the selection of the filter system, this was a matter of considerable study and reflection, and at first of some difficulty, for there were several candidates in the field, but when it was once realized that the principles to be established must be (i) the use of a mechanical filter and mechanical film, and (ii) a filter which had proved its competence under the local conditions of the country, the selection was no longer difficult for there was and is at present but one system which fulfils these requirements, and accordingly the Jewell system was chosen.

It should be stated that on the suggestion and study of this Department four separate modifications of the ordinary Jewell installation are being adopted, and it is believed that these will largely add to its efficiency. These modifications are :—

1. Automatic mechanism for the addition of the coagulant; the control of this mechanism is based on the principles of the Venturi-meter.

2. Interlocking of the valves for the purposes of preventing possible irregular action, thus eliminating one of the very few personal factors that enter into the system.

3. A mechanical contrivance for passing the re-wash water through the Weston controller in the same way as the filtered water. This will entirely obviate any possible shock to the film of which hitherto there has been a possible risk at the time of changing from the re-wash current to the normal flow.

4. The provision of an emergency method of sterilization. This will remove any possible risk of infection when it is put into action. It is believed also that it will also remove the well known unpleasant odour of the green water, but this cannot as yet be defi-

nitely affirmed for the reason that for the last two years this characteristic of the critical season has been distinguished by its absence ; a fact probably due to the profound changes which have recently taken place in the regime of the river throughout its length, but as the result of which sufficient opportunity of experiment has not been afforded.

Giza Water Works.—The rural and semi rural area of Cairo on the western bank of the Nile is supplied with water from the Giza Water Works, managed by the Public Works Department. This installation consists of a series of open sand filter beds and sedimentation tanks. On the advice of the Health Department recent improvements in the direction of fitting mechanical (Lindley) regulators and provision of a more equal distribution of the coagulent have been latterly effected, and apart from the inevitable defects inherent to an open sand system in this country, the results are generally very satisfactory. The defects alluded to are neutralized as far as possible by very careful management.

Experiments with other systems of filters—mechanical and otherwise, including ozone sterilization—are about to be undertaken.

(b) *Drainage.*—It is satisfactory to be able to state that the long delayed drainage of Cairo has at length taken shape and the first stages of the scheme are now in process of execution.

This work, which has been unceasingly urged by the Public Health Department for many years has not come into its inception a moment too soon. The increase of that class of population which uses the water carriage system and the concentration thereof brought about by building large aggregation of flats and tenement houses has resulted in such a massing of human beings in restricted space that with no provision for adequate drainage certain parts of the town of Cairo have become in the season of the high Nile literally a seething swamp; giving rise to conditions of unhealthiness and offensiveness that it is difficult to imagine in a civilized city and almost impossible to deal with.

When it is realized that by far the greater part of the liquid off-flow of the city—drainage as well as surface water—has to be removed by the natural process of percolation, that the lower sandy strata are water-logged by the Nile infiltration rising as and after the river itself rises, that the superjacent clay-like soil gives little facility for rapid percolation, and that as the subsoil water rises the vertical area for percolation is still further reduced to a minimum, it will readily be understood that the mechanical difficulties of disposing of the daily increasing off-flow are almost insurmountable, while the extra-territorial status of foreigners in this country, rendering as it does the existing regulation for the emptying of fosses practically a dead letter, still further adds to the discomforts of the public and to the difficulties of the Department.

In March 1907 the newly constituted Drainage Authority submitted five draft schemes to the Department of Public Health. Three of these could not be accepted by this Department for various reasons ; of the others, No. 1 (Tura) scheme was open to the objection that the projected disposal site was on the road to Helwan (a developing health resort) and in close proximity to a new building estate, and also because an alternative site appeared to the Department unsuited to a sewage farm, and combined certain elements which tend to exaggerate the nuisance of a sewage disposal area.

No. 2 (Khanka) scheme had some drawbacks, but modifications were recommended and

if these could be achieved it was considered that this scheme possessed the elements of one which could be made practical.

Other schemes and modifications of schemes were subsequently presented until at last No. 11 was, as regards its main principles, accepted in February 1908 by this Department. These " main principles " which have formed the basis of the scheme were as follows :—

1. The division of the drainage surface into " gravitation and sectional " areas.
2. The carrying of the sewage in the direction of the natural slope of the country.
3. The choice of site of the pumping station, near Kafr el Gamus.
4. The choice of site for the Sewage Farm at Khanka.

Specific reservation was, however, made as to certain other features which were directly mentioned in the proposals or arose out of a careful consideration of them. One of these was the disposal of " surface drainage " as distinguished from domestic drainage, and on this question it was laid down that in no case would the surface drainage be permitted to find its way to the Nile or Ismailia Canal.

In Cairo the various off-flows may be classified as follows :—

1. Domestic sewage.
2. Surface drainage (dry weather), (the existing effluent is as foul as, and more offensive even than domestic sewage).
3. Surface drainage (wet weather), (first off-flow).
4. Storm water after the first off-flow (storm over-flow).

The drainage problem was contained in the devising of a method of satisfactorily disposing of these four factors. As regards the first three the Public Health Department laid down the principle that these elements must in no case be discharged into the Nile or Ismailia Canal. As regards the fourth factor, no objection would be raised to this being allowed to escape by over-flow weirs after a certain high degree of rainfall had taken place, and therefore not only extensive dilution of the surface off-flow had followed, but the surface drains would have already been sufficiently scoured.

These conditions were accepted by the Drainage Department which in consequence stated that all surface drainage would be conveyed to sealed sewer mains and discharged at Khanka (the Disposal Farm) while storm-water would only find its way to the Nile after a rainfall exceeding 25 millimetres per 12 hours. By this arrangement any risk of pollution of the Nile or Ismailia Canal was obviated.

The then Adviser to the Ministry of Public Works (Sir William Garstin, G.C.M.G.), in a memorandum covering the proposals, ratified these conditions and took note of the specific reservations of the Public Health Department which were to form the subject of future negociations.

At the present moment the following contracts (included in Mr. Carkeet James' " Report on the First Section ") have been or are about to be made, and work has already begun :—

Surface Water Drainage.
Purification Works at Khanka.
Rising Main.
Main Pumping Station Foundations, Buildings and Quarters.
Main Collector.
Sewerage of Zeitun and Suburbs.
Power Station Quarters at Pont Sahel.

(c) *Conservancy.*—The Cairo Scavenging and Watering Service operates over an area of over 4 million square metres of roads, streets, squares and lanes in the city and suburbs of Cairo.

According to the Tanzim figures, the paved area in Cairo was :—

At the end of 1908	square m.	2,300,000
During 1909, this area was increased by	„	112,220
The total paved area at the end of 1909 was therefore	„	2,412,220
Earth-roads, approximately	„	1,700,000
		4,112,220

Of the total increase in new paved roads made in 1909, an area of 60,070 square metres was handed over up to the time of sending in Budget requirements ; for this area only a sum of L.E. 1,142, sufficient to deal with an area of 52,000 square metres, was granted by the Ministry of Finance for 1910.

The Service coefficients remain as last year, viz., L.E. 10 per 1,000 square metres for scavenging per annum, and L.E. 12 per annum for watering per 1,000 square metres.

As regards the disposal of refuse the problem is becoming a pressing one ; part of the dry refuse is now used for issue to the bath proprietors for the purpose of heating the baths ; another part, the most offensive part, is burnt at the destructor ; while a very large margin remains to be disposed of by dumping in more or less convenient places. Of these places the most satisfactory are low-lying parts of the town or suburbs which accumulate infiltration water and thereby become a permanent nuisance and a breeding ground for mosquitoes. Unless carefully managed, the filling of these low-levels is not without its drawbacks, but if the refuse be daily covered with a layer of clean earth, or, if dry enough, burnt for a few inches of its depth, then the nuisance is reduced to a minimum, and at the worst it is but a temporary one while the existing infiltration areas—birkets—are persistent and permanent. This method is now being applied to some low levels at Gezira, which last year were the abode of numerous anophelines.

Rubbish Depotoirs.—The Service filled in birkets at Bulac Dacrur, Bulac, Abbassia and one partially at Roda.

The existing rubbish heaps are at Husseinia, Shanawani. Madbah, Rod el Farag, Embaba and Dokki.

Rubbish sold to the baths realized L.E. 617.

Destructor.—The destructor worked 264 days during the year. The credit of L.E. 600 on prophylactic measures was stopped in the 1st May 1909. Thus the labour credit is now burdened with this expense at the cost of the cleansing of the city.

The cost of working the destructor and screen in 1909 was L.E. 1,500.

Asphalt.—No increase has been made in the asphalt area in 1909. The cost of washing remains the same, viz., L.E. 27 per 1,000 square metres.

Water.—Water used in street watering and washing is shown is the attached list, as compared with 1908:—

TABLE XXVIII.

WATER CONSUMPTION.

	1908.	1909.
	Cubic metres.	Cubic metres.
December	27,782	32,024
January	27,039	30,933
February	35,281	44,463
March	57,330	70,064
April	65,661	62,121
May	100,489	97,000
June	88,065	108,265
July	104,659	98,763
August	89,756	94,947
September	77,968	71,941
October	57,714	61,446
November	50,191	50,263
TOTAL	781,935	822,230

Animals.—The service possessed at the end of 1909 :—

436 mules.
26 donkeys.
13 horses.

	Bought.	Destroyed.	Died by accident.	Sold.
Mules...	43	31	3	1
Donkeys	1	—	—	—
Horses	4	1	—	—

Average price per mule, L.E. 23.

Twelve mules, belonging to the Ministry of Finance, for transport of the Mahmal, but hitherto maintained by the Service, were handed over to the said Ministry on March 15th, 1909.

Contract prices for forage, 1909.

	L.E.	M.	
Barley...	0	900	per ardeb of 112½ kgs., Bulak Stables.
Tibn	2	450	per ton of 1000 kgs., Bulak Stables.
Bran	5	800	per ton of 1015 kgs., E.A. Siding, Tura.
Rice straw fer bedding	1	500	per ton of 1000 kgs., Abbassia Siding.
Berseem and doura	0	40	per kantar delivered in the various stables, etc.

Service harness.

KIND.	Number.	Average price.		Total value.	
		L.E.	M.	L.E.	M.
Single sets	186	3	450	641	700
Double sets...	113	4	950	559	350
Donkey sets	12	3	...	36	...
Carriage sets (double)	1	12	...	12	...
Dogcart sets (single)...	5	7	...	35	...
Saddle...	1	3	600	3	600
Donkey saddles...	13	1	...	13	..
TOTAL VALUE				1,300	650

TABLE XXIX.

Rolling Stock.

The Service possessed up to the end of 1909 the following :—

Rolling Stock.	Number.		*Rolling Stock*—(cont.).	Number.	
(*a*) Carriages	3		(*f*) Machine brushes :—		
(*b*) Cart...	1		Double	32	
(*c*) Motor wagon...	1		Single	1	
		5			33
(*d*) Water carts :—			(*g*) Trollies :—		
Double	59		Double	9	
Single	67		Single	4	
Donkey	3				13
		129			
(*e*) Dust carts :—			(*h*) Slop carts		4
Double	44		(*i*) Lutocars		16
Single	137		(*j*) Hand carts (various)		60
Donkey	12		(*k*) Dust bins		283
		193			

The Service purchased in adjudication during the year :—

6 Hellmers' sprinkling vans.
6 Double dust vans.
4 Machine brushes.

(ii) Alexandria.

The International Municipality of Alexandria is the oldest existing municipal body in the country, having been instituted by the Decree of January 5, 1890.

It is the direct succession of the " Commission d'Edilité " established many years ago by a body of merchants and others for the purpose of paving, draining and lighting the main roads of the business part of the city, so that they should be rendered possible for the heavy and increasing traffic of the port.

The Public Health Service of the Municipality, originally organized by Prof. Dr. Bitter (a pupil of the late Professor Koch and a lecturer in Hygiene at the University of Breslau), and now directed by Prof. Dr. Gotschlich, has done much to ameliorate the sanitary conditions of the city where plague has been endemic for more than 10 years.

The Service is well organized, and besides the usual routine of dealing with licensed establishments, infectious disease, and the control of undesirable immigrants and passengers, it has paid recently considerable attention to the improvement of food supplies and the incidence of infant mortality.

(a) *Water supply.*—Alexandria also led the way in the improvement of the public water supply, and was the first town in Egypt to adopt a mechanical system of filtration (the Jewell). The installation was completed in 1905, and though the source of the raw water has much against it (it is derived from the Mahmudia Canal, which is probably the foulest canal in Egypt) the filters have proved an eminent success and the character of the water distributed leaves nothing to be desired.

(b) *Drainage.*—As regards drainage the town has been less fortunate, although an efficient system dealing with domestic sewage and other off-flows has been persistently the most prominent need of the town.

There have been various proposals put forward from time to time, each of them representing various degrees of divergence from accepted cardinal principles; and sections of these proposals have from time to time been carried out, producing little or no amelioration of the existing conditions; for the main problem—indeed the fundamental raison d'être of a drainage scheme—has not yet been touched.

It is scarcely necessary perhaps to labour this point, but it is certain that until all waste matter, solid and liquid, is removed *immediately* from the region of habitations there can be no realization of a proper scheme of a drainage and the resulting improvement of sanitary conditions.

The system of leaving intact the fermenting fosses in the basement of crowded houses and tenements and of removing the surplus fluid by an overflow drain does nothing for sanitation, it merely permits the householder to disembarass himself of the charges for emptying his fosses at the expense of the authority which lays the drain while all the causative factors of sickness and mortality are left behind to continue their banal influence.

With this retrospect therefore it is satisfactory to know that a practical scheme of drainage has been drawn up by Mr. Lloyd Davies (the Chief Municipal Engineer), and to feel confidence that if put into proper execution it will fundamentally alter the sanitary conditions of the town.

It is true that the discharge of crude sewage into the sea, at a distance of 800 metres from the shore, even at a depth of 19 metres, is not above criticism, but even that condition, which can be rectified by treatment at a latter date and when funds permit, is not sufficient to counterbalance the advantages of the early application of an otherwise reasonable scheme. The ancient proverb of "half a loaf being better than no bread" is not without its application in this case, though it is to be feared that in previous proposals the offer was more often of a stoney nature.

It should be added that though no precise statement is made in Mr. Lloyd Davies' Report as to the intention of the Municipality to suppress and fill up all existing fosses, it is understood that this is regarded by the Municipal authorities, as indeed it is by this Department, as a most important and integral part of the scheme.

(c) *Conservancy.*—The dry conservancy of the city has been effected by removal to distant depots where the accumulations are allowed to rot and finally disposed of to market gardeners and others for manure while the cleaner and drier refuse is selected for delivering to the baths proprietors for the purpose of heating their establishments.

A contract has, however, now been made with a syndicate for the operation of the "Schoeller" system to the greater part of the city refuse. This appears to be an excellent method as carried out at Neuilly (near Paris), and personal observation of this installation leads to the opinion that it is one well suited to the requirements of Alexandria.

(iii) Port Said.

(a) *Water supply.*—A new installation of filters on the Puech-Chabal system has been in course of erection by the Suez Canal Company since early in 1908, but it is not complete, and the official testing by the Department has not yet been possible.

(b) *Drainage.*—Port Said, situated as it is on a low-lying and perfectly flat spit of land, where the ground water is seldom more than a metre from the surface, is as much in need

of draining as any town in Egypt, and a scheme has been prepared on the sectional principle with motive power provided by the compressed air system of Shone. The necessary demand to the European Powers for the increase of the house-tax in order to pay the interest on the capital cost has already been made some considerable time ago, but the provision of the capital sum itself is still a difficulty that has not yet been solved ; this fact appears to be not unconnected with the refusal of the General Assembly to agree to the Suez Canal Convention. It is hoped that these difficulties may be surmounted, for the urgency of the drainage question is beyond dispute, and its achievement would go far to finally solve the mosquito question which is now dealt with, with some considerable success, by the petroleum method.

(c) *Conservancy.*—Dry refuse is still disposed of by "dumping," and the method is not without its advantages in filling the many low-lying portions of ground which are found at the southern and western sides of the town on the shores of Lake Menzala. A credit has been provided by the Canal Company for the construction of a small destructor which may be useful in emergency, even as the prevalence of infectious disease, but at the time of writing no steps have yet been taken for the erection of the installation.

(iv) Suez.

The importance of Suez from the point of view of public health is that it is the entrance gate to this country for the great majority of merchandise and passengers from the East as well as the head-quarters of the pilgrim traffic. These special conditions have already been dealt with under the heading of "*C*" *Sanitary Defence.*

As regards local conditions it is worth while noting that in speaking of Suez there is included not only the old town—with a population mostly native—situated at the tail of the sweet water canal and which was the ancient point of departure to and arrival from the East, but also the newly established and modern town of Port Tewfik—with a population mostly European—at the southern end of the Maritime Canal and a large district of agricultural and garden land sparsely populated and extending for some miles northwards along the banks of the sweet water canal ; a district which is one of those of the whole country most threatened by malaria. Here there are combined a busy port, two urban areas (one European and one native), and a large rural district, all of which together present every variety of public health problem, and for these reasons Suez, although its population is comparatively small, is one of the most important sanitary charges in Egypt.

(a) *Drainage.*—As regards drainage the old town of Suez contents itself with the fosse system which is sanctified by age and the custom of the country. In Port Tewfik the Canal Company section is properly drained, the elements for biological treatment being interposed between the houses and the out-falls into the Maritime Canal. The rest of Port Tewfik has no drainage system, each house either draining into the Canal, or being furnished with a fosse system.

The question of the drainage of the native town is not likely to engage the immediate attention of the Government or the local authorities for some time to come. It may, however, be said that the amount of water supplied to the inhabitants has doubled in the last two years and there is little doubt that soakage of the ground is increasing, but there is as yet no evidence to show that waterlogging of the soil has reached a dangerous degree.

(b) *Water supply.*—An installation on the Puech-Chabal system has recently been completed by the Suez Canal Company. It has not yet been possible to carry out a detailed examination of its results, but no complaints are now made of bad quality or insufficiency of the supply.

(c) *Conservancy.*—Is well carried out by the Municipality. The rubbish is dumped outside the town and covered with a layer of earth. It is removed by a contractor for purposes of manure, but not until after a year's delay.

G.—MUDIRIAS AND PROVINCIAL COUNCILS.

Mudirias.

In the Mudirias (provinces) each chief town is the seat of the local Government Authority and is provided with either a mixed Municipality or a Local Commission which is the chief local guardian of sanitary matters within its circumscription. The following is a summary statement of the position of the chief sanitary interests in each Mudiria town.

Damanhur (province Behera). Population 32,122. Mixed Municipality.

(a) *Water supply.*—A Jewell filter plant was completed in August 1909 and gives a satisfactory supply.

(b) *Drainage.*—A surface drainage system in connection with the paving of the roads of this town (which suffers much from wet weather in the winter), has been designed, and partially carried out. The outfall is in a somewhat foul agricultural drain to the north of the town, and is not entirely satisfactory. The fosse system exists for domestic use.

(c) *Conservancy.*—Dry refuse used for baths and for dumping.

Tanta (Gharbia). Population 57,289. Mixed Municipality.

(a) *Water supply.*—From deep tube wells, bacteriologically pure, but contains iron and manganese, and is considerably harder than Nile water. It is unpopular, and the inhabitants have petitioned and are agitating for a Nile water system with filters.

(b) *Drainage.*—A surface water drainage has been designed, but is not yet finally approved. *

(c) *Conservancy.*—Dry rubbish is used for baths and dumping. Two simple destructors of the lime-kiln pattern exist for use in case of emergency.

Shebin el Kom (Menufia). Population 20,512. Local Commission.

This town is favourably placed on the Bahr el Shebin, one of the largest canals in Lower Egypt. It has no special water supply, nor drainage.

---

* Since writing the above the scheme has been approved by the Ministry and will shortly be put into adjudication by the Municipality.

Mansura (Dakahlia). Population 33,580, including many Europeans. Mixed Municipality, which is the next oldest after Alexandria.

(a) *Water supply.*—A Jewell filter plant deriving its raw water from the Sharkawia Canal. It is satisfactory.

(b) *Drainage.*—No drainage system exists, but a serious movement in favour of establishing a scheme both for surface water and domestic drainage is on foot.

(c) *Conservancy.*—As usual. There is a destructor (seldom used, however), which is available in case of emergency.

Zagazig (Sharkia). Population 35,715. Mixed Municipality.

(a) *Water supply.*—By deep tube wells which have the same faults as those of Tanta. The inhabitants are agitating for a Nile water filter system.

(b) *Drainage.*—No drainage system exists.

(c) *Conservancy.*—The usual, with a simple lime-kiln pattern destructor.

Benha (Qaliubia). Population 8,462. Local Commission.

(a) *Water supply.*—A Jewell filter installation is in course of erection and should be completed shortly.

(b) *Drainage.*—None.

(c) *Conservancy.*—Usual.

Giza (Giza). Population 16,820. Local Commission.

(a) *Water supply.*—Situated on the Nile opposite Cairo, the poorer inhabitants draw direct from the river. A service of filtered water supplied by the Government slow sand filter installation is laid on to the town and to the better class houses.

(b) *Drainage.*—None.

(c) *Conservancy.*—Usual.

Fayum (Fayum). Population 31,262. Mixed Municipality.

(a) *Water supply.*—No public supply exists, with the exception of a number of pumps placed on the banks of the Bahr Yussef, which traverses the centre of the town. A filter installation is urgently needed for this town, which is perhaps the most of any in need of one.

(b) *Drainage.*—None.

(c) *Conservancy.*—Usual.

Beni Suef (Beni Suef). Population 15,297. Mixed Municipality.

(a) *Water supply.*—A Jewell filter installation with an intake from the Nile is about to be laid down.

(b) *Drainage.*—None.

(c) *Conservancy.*—Usual.

Minia (Minia). Population 20,404. Local Commission.

(a) *Water supply.*—No general public supply exists, but the town is favourably situated on the Nile, whence the inhabitants derive their supply by hand carriage.

(b) *Drainage.*—None.

(c) *Conservancy.*—Usual.

Sohag (Girga). Population 13,930. Local Commission.

(a) *Water supply.*—No public supply, but the inhabitants draw by hand from the river.

(b) *Drainage.*—None.

(c) *Conservancy.*—Usual.

Kena (Kena). Population 24,364. Local Commission.

(a) *Water supply.*—The town lies some distance from the river (about a mile) from whence is drawn the public supply of unfiltered water which is eagerly sought by the people.

(b) *Drainage.*—None.

(c) *Conservancy.*—Usual.

Luxor. Population 7,018. Local Commission.

A deep well supply was installed some years ago, but it is now only used for road watering purposes, as the inhabitants will not utilize it for domestic consumption. This town is specially in need of a better water supply. As is well known it is one of the chief tourist resorts of Upper Egypt, and though the hotels make their own arrangements for filtration in the interests of their clientele, it is desirable that the native population should be furnished with an adequate supply of pure and acceptable water as soon as possible.

Aswan (Aswan). Population 13,005. Local Commission.

(a) *Water supply.*—The same remarks apply as above (Luxor), with the exception of the reference to wells.

(b) *Drainage.*—None, except at the hotels, where special arrangements are made.

(c) *Conservancy.*—Usual, but it is very well carried out, and the simple destructor provided works in an admirable manner.

Provincial Councils.

The re-organization of these bodies and the extension of the duties and powers allotted to them are of too recent a date to as yet furnish much matter for report.

It is understood that this newest effort to build up local administrative bodies based on popular representation is specially associated with an endeavour to interest the people in matters that affect their future welfare, and particularly in the direction of primary and technical education.

For the purpose of raising funds they are permitted to impose an additional land-tax

not exceeding five per cent. of the actual assessment; a further percentage may also be raised with the consent of the Government, and of the total amount so raised a portion only or the whole may be devoted to the cause of education primarily and afterwards to other works of public utility. It is hoped that at least part of the balance may be used for purposes of local and village sanitation, of which the country sadly stands in need. A circular has been issued to the local health authorities recommending that steps should be taken to interest the Provincial Councils in matters of sanitation, and that of the many subjects worthy of attention those included under village water supply, village infectious hospitals (on a very small scale), the provision of trained " barbers " and the filling of birkets might profitably form the subject of consideration and future action.

PART III.—SCIENTIFIC ESTABLISHMENTS.

(i) Hygienic Institute.

This Institute was founded in 1896 by Sir John Rogers, K.C.M.G., with the co-operation of Prof. Dr. Bitter, who was charged with the organization, and subsequently the direction, of the establishment. Since that time the Institute has been of inestimable value to the Department and to the Government, chiefly in such examination and identification of bacteriological and pathological specimens as is required for the rapid and certain diagnosis of plague, cholera and other dangerous diseases ; it has already been extended on one occasion (in 1906), and a project with plans is now under consideration for still further extension.

This projected extension is a matter of special necessity, not only on account of the increase of routine work, but also because it is recognized that the sanitary administration of the country has arrived at a point where scientific examination of the various aspects of health problems in Egypt is an indispensable preliminary to much of the work that now lies before the Department.

There are now probably few countries in the world that offer so attractive and untouched a field of scientific investigation as does Egypt. In many parts of the country the population is not sufficient to work to the best advantage the resources of the soil, and yet the most valuable economic asset of labour is decimated by the infectious diseases that have been already referred to in a previous section and the prevention of which has yet to be a matter of study ; the initial causative factors of trachoma (the origin of the greater part of the eye disease of the country) are still unidentified; the investigation of pellagra, which causes 20 % of the lunacy and much more of the physical disability of the country is only being begun ; the penetration of the mysteries connected with the methods of infection of a large proportion of the people with anchylostomiasis and bilharziosis, and parts of the life-histories of the parasites concerned, has still to be completed ; * the methods of communication of typhus and relapsing fever have by no means yielded up their secret ; the distribution of malaria has not yet been defined, and the factors which are still wanting to determine its actual presence under apparent conditions of potential existence are as yet undiscovered ; the diseases of cattle and domestic animals, of camels and horses, afford a gigantic field for investigation which would readily repay the Government for such financial sacrifice as is necessary to place a work of this kind on a sound footing; finally, the rôle of insects and the lower scale of animal life in the propagation of disease among men, animals and crops is still another field that offers promising results. (In connection with this point it is satisfactory to be able to state that relations have been established with the Entomological Committee of the Colonial Office—presided over by Lord Cromer—and it is hoped that mutual advantage may accrue.)

It is clear, therefore, that there is no lack of useful experimental and investigational

* Professor Loos has already done much work in this domain of investigation.

work to be done, but the work awaits a suitable series of laboratories and an adequate staff to undertake it. For this purpose money must be spent, and spent freely ; but it is certain that it will, in the future, be returned to the Government many times over, for as nothing is more wasteful than the false economy of unscientific methods; so no expenditure is more surely and safely remunerative than that which follows where honest enquiry and the quest of exact knowledge * direct.

Routine Work.

The pressure of the routine work of the Institute continues to increase notwithstanding the fact that owing to the difficulty of obtaining an adequate staff and the desirability of devoting as much time as possible to research, efforts have been made to keep it within the limits of absolute necessity.

During the past year 275 cultures from suspicious cases of plague were received from the different parts of Egypt. Of these, 77 were positive. It should be added that in order to reduce as much as possible all unnecessary labour suspected plague cultures are forwarded to the laboratory only at the beginning and end of local outbreaks.

Blood examinations—microscopical and by agglutination test—were made on 973 specimens of blood (as against 411 in 1908) sent from the Infectious Diseases Hospital, Cairo ; the Deaconnesses, Military and Anglo-American Hospitals, Cairo ; the Prisons Department; the Suez and Mansura Hospitals, and also from private practitioners. These examinations were mainly made for typhoid, Malta and relapsing fevers, and for malaria ; but during the year, in testing the agglutination reactions, a routine practice has been followed of testing the blood against the para-typhoid bacillus (type "B") as well as against the organisms of typhoid and Malta fevers. This was done in about 700 cases; in three of these a positive reaction was obtained with para-typhoid " B," while in 1908 there were 12 such cases, showing that infections with this bacillus are by no means rare in Egypt.

A considerable number of specimens have been examined for the Veterinary Department in connection with the diagnosis of epizootic lymphangitis, anthrax, pyrosomata of cattle and horses, and other diseases.

Numerous tests of various disinfectants have been made, especially with regard to their action on the organisms of plague and cholera.

In addition to the foregoing, water-examination forms a most important part of the routine work of the Laboratory, and with the extension of public water supplies throughout the country this is becoming a very large section of the duties of the staff. Much time has been occupied by the chemical and bacteriological examination of the water supplies of Cairo and of the various provincial towns. During the year 1908 the control of the Giza Water Works was handed over to the Department, and weekly chemical and bacteriological analyses are now made, both of the Rod el Farag and Giza waters. The former supplies the City of Cairo and the suburbs on the east bank of the Nile, and the latter the island of Gezira and the suburb of Giza. A daily bacteriological examination of the City service as supplied to the Institute is also made.

These analyses are made under considerable difficulties in the small chemical laboratory of the Institute. This laboratory was built for the chemical side of the bacteriological

---

* As examples of the immediate return afforded by scientific methods may be quoted the recent remarkable reduction in disease and mortality of the British army in India and the extraordinary results of the enteric prophylaxis undertaken in Germany under the œgis of the late Professor Dr. Koch.

work of the Institute and was not intended for chemical analyses on any large scale. So long as the number of analyses was comparatively small it was possible to carry out the work here, but with the constantly increasing number of water supplies in Egypt and the necessity for a regular control of these, a special laboratory for the purpose has become essential. This is the more so as the chemical work necessary is not limited to mere regular analyses, but must be extended so as to deal with the many questions arising in connection with the various water supplies.

As an example, the question of the dissolved gases may be cited. This is most important for a complete knowledge of the properties of the water, but its investigation is at present impossible, as neither the necessary space nor apparatus is available.

The control of the Giza water supply was not limited to bacteriological and chemical examination only, but various studies of a biological nature were made on the Nile water, concerning the plankton of the Nile (especially the algæ) and the origin and possible removal of the odour appearing at the time of the low Nile.

Moreover, as in 1908, during the months of May, June and July—the critical period —samples of Nile water were examined weekly bacteriologically and chemically (for organic matter) from 5 different points of the river situated between Tura and Rod el Farag, 3 samples being taken on each spot.

The experiments concerning the removal of iron and manganese from the Rod el Farag well water were continued during the first part of the year on the experimental plant erected at Rod el Farag, and have yielded the same satisfactory results as the previous experiments.

The following is a table showing the routine work done in the Hygienic Institute during 1909 :—

TABLE XXX.

Bacteriological Examinations.

Plague :—275 cases, of which 77 cases positive, and one case positive for anthrax.
Diphtheria :— 517 cases, of which 238 cases positive (in 1908, 364 cases were examined).

Blood Examinations.

973 cases examined (in 1908, 412 cases).

Specimen from	No. of cases.	Typhoid.	Malta.	Paratyphoid B.	Malaria.	Relapsing.
Infectious hospital	468	59	2	1	...	117
Deaconesses	95	46	4	...	...	...
Anglo-American	21	7	...	1	...	...
Asylum	52	11	1	...	...	...
Prisons	242	...	...	...	3	14
Provinces	38	10	3	1	...	4
Private practitioners	57	12	2	...	...	...
Totals...	973	145	12	3	3	135

On these samples about 700 were examined at the same time for typhoid, Malta fever and paratyphoid B.

Examination of dejecta for typhoid, 53 cases.

Water Analysis.

317 chemical analyses of various origins.
Bacterial examination of water :—
Daily. Tap water Cairo City supply.
Weekly. (1) Rod el Farag wells, 6 samples. (2) Giza river supply, 5 samples.

Research Work.

The question of the signification of *bacterium coli* as an indicator of sewage contamination of water, especially of well water, was studied. The condition of life and multiplication of this organism in water were investigated.

From these experiments it seems to result that considerable caution must be used, especially in the case of deep well waters containing crenothrix, in regarding the bacillus coli as an indicator of sewage pollution.

A considerable amount of work has been done in connection with the preparation of *cattle plague serum* at the Serum Institute. Besides the continuous control of the practical work of serum production, considerable time and care was devoted to research into properties of the serum manufactured. This research has yielded already most promising results, both from a theoretical and practical point of view. A paper, No. 4,1910, dealing with the subject, is in the printer's hands.

The work concerning the identification of *rats* and their *fleas* from different parts of Egypt has been actively continued during the year. More than 3,000 living rats have been sent to the Institute from various districts of Lower and Upper Egypt, and the species of the rat as well as the number and species of fleas found on each rat were determined. All the rats were opened and their internal organs examined for the possible existence of plague. Many of them were also examined for the presence of trypanosoma.

The results of these investigations have been carefully arranged in tables from which the exact distribution of the different species of rats and fleas will be worked out.

Until a much more extended survey has been made it would not be safe to make any generalization of the results. So far, however, it would appear that the number of fleas found on the individual rat is somewhat small, or at any rate much smaller than the numbers recorded generally in India ; also that though the Pulex cheopis is a common species found on the rat, it is P. irritans which is found on the plague patient.

Besides the rat-work done in the Institute, investigations have been carried out in several plague stricken villages in order to determine more closely the connection of rats and fleas with the outbreaks of plague.

As one interesting result of these investigations it may be noted that field rats were also found infected with plague.

The investigations on *relapsing fever* were continued with some interesting results as regards the nature of the parasite and immunity. It has, however, not yet been possible to establish with certainty the natural way of transmission of this disease, viz., to determine the blood-sucking insect causing the infection.

Many experiments made with ticks, bugs and lice, on monkeys, have given a negative result. Many experiments have shown that the spirochæte causing relapsing fever in Egypt is distinctly different from the American spirochæte, and from the spirochæte of the so-called " tick fever " of East Africa. It seems also that it differs in some particulars from the European (Russian) spirochæte in the fact that the Egyptian microbe cannot be trans-

mitted continuously from rat to rat. The injection of blood of monkeys suffering from relapsing fever (in which the bacilli are killed by heating) confers immunity on monkeys; it remains still to be determined whether this immunity is an active or a passive one.

The research into the ætiology of *trachoma* was actively continued, but did not yet lead to a definite conclusion as regards the true agent of the disease. Results of high scientific interest concerning the bodies of Provazeck have, however, been obtained which have been published by Dr. Dreyer in connection with Dr. Meyerhoff.

The investigations concerning the prevalence of *Malta fever* amongst the goats in Egypt were continued, and the blood of goats from different places of Lower Egypt examined by the agglutination test.

The following table shows the results obtained during 1909.

TABLE XXXI.

GOATS EXAMINED DURING 1909.

Agglutination.

(Micrococcous Melitensis.)

Town or district.	Positive.	Negative.	Total.	%
Port Said	8	133	141	5·6
Cairo	...	80	80	...
Alexandria	...	16	16	...
Suez	...	6	6	...
Ismailia	...	11	11	...
Damietta	...	8	8	...
Charkia	1	25	26	4·0
Menufia	1	13	14	7·6
Behera	...	21	21	...
Gharbia	...	5	5	...
Mataria	...	15	15	...
El Arish	...	9	9	...
Totals	10	343	352	2·8 %
Or, excepting Port Said	2	209	211	1·0 %

At the present time all the goats of Port Said (about 1,350) are being examined by the agglutination test for the presence of Malta fever. Owing to the large number of animals to be dealt with this work will extend over several months. The results obtained with the first lot of 100 goats have given 12 % positive reactions, which sufficiently shows the importance of the question.

A considerable amount of work was devoted to the study of *Opsonins*, and good results were obtained especially as regards the vaccination against Staphylococci.

The research concerning the manufacture of the *antiscorpion serum* has come to a definite result as regards the best way of manufacturing a highly efficacious serum. As

the results obtained by this serum continued to be most satisfactory, it has been decided by the Government that the serum should be manufactured regularly on a large scale ; a work of this nature being beyond the faculties of the Hygienic Institute, an arrangement has been made with the Lister Institute of Preventive Medecine, London, for the future manufacture of the antiscorpion serum on the lines established in the Cairo Institute.

Microscopical examination of various skin tumours led to the discovery that they are often caused by a parasite known under the name of "*Leishmannia Wrighti,*" and described from different countries as being the cause of affections called Oriental sore, Aleppo boils, etc.

This affection seems not to be rare in Egypt. Indeed, since attention has been drawn to its presence, it has been found several times in Kasr el Aini Hospital by Drs. Fergusson and Richards, who have published an extensive memoir on this affection from a pathological and clinical point of view ; the first discoveries of the Hygienic Institute and the photographs of the parasite made there are incorporated in this paper.

Lately also the ætiology of *typhus fever* has been studied experimentally on monkeys and has already given promising results. The disease is transmissible to monkeys. The virus of the disease does not pass through Berkfeldt filters. At present the role of biting insects in the transmission of the disease is under investigation.

The *trypanosome,* which is the causal agent of the disease of camels known as " gaffa " by the Bedouins, and which leads to considerable commercial loss, has been the object of a large number of experiments. This disease, which is transmitted by a biting fly (the individual species not being yet identified), causes much sickness among camels in many parts of the country at certain times of the year, and it was hoped that an investigation of the trypanosome might point out some method of immunization against the disease.

The experiments are not concluded, but from the results obtained so far, and from our knowledge of other pathogenic trypanosomes, it would appear probable that an immunity is not easily produced and that attention would be more profitably directed to the fly which is the transmitter of the disease.

Most of the research work carried out in 1909 is being continued in 1910.

The following publications have emanated partially or entirely from the Hygienic Institute during the last two years :—

(1). Dr. Bitter, in connection with Dr. Gotschlich.

" The use of chemicals for sedimentation of water in sand filtration with a special reference to the American rapid filters." *Zeitschrift für Hygiene,* Vol. 59, 1908.

(2). Dr. Todd.

Some experiments on the filtration of cattle plague serum." *Journal of Hygiene,* Vol. VII, No. 4.

(3). Dr. Todd.

" An anti-serum for scorpion venom." *Journal of Hygiene,* Vol. IX, No. 1.

Department of Public Health
Annual Report for 1909.

Erratum Page 95 :—

15 line from top

After "preparation"

Read "of glycerine and kept in cold chamber till sent out for use".

(4). Dr. Dreyer.

"On a case of mixed infection with typhoid and Malta fevers." *Münchener Med. Wochenschrift*, 1909, No. 48.

(5). Dr. Dreyer.

"On protozoal diseases of men and animals in Egypt." *Archiv fur Schiffs und Tropenhygiene*, Vol. XIV, 1910.

(6). Dr. Dreyer, with Dr. Meyerhoff.

"On the existence of Trachoma corpuscles in Egypt." *Klinische Monatsblätter für Augenheilkunde*, Vol. IX, p. 476.

(ii). Vaccine Institute.

The Vaccine Institute provides a very large proportion, if not almost all, of the vaccine used in Egypt and the Sudan. It is derived from buffalo calves which are bought by the Department, and subsequently re-sold after the vaccine has been collected.

The vaccine strain has been retained now for many years and has been uniformly satisfactory. It is preserved with a preparation of glycerine and carbolic acid and kept in ice till sent out for use. It is subjected to the bacteriological control of the Hygienic Institute which guarantees its purity and quality.

In 1909 the amount of lymph collected was 1,143,000 units, as against 610,000 in 1908.

The amount issued in 1909 was as follows :—

Gratis.	
To Inspectorates and hospitals of the Department	437,250
To charitable institutions	87,040
On payment.	
Egyptian Army	7,530
Sudan Government	65,620
Army of Occupation	5,660
Ministry of Education	12,821
Alexandria Municipality	105,200
"Wakfs" Administration	1,835
Prisons Department	14,036
Dispensaries and medical men	14,035

In addition to the above, there were used for vaccinating calves 331,373 units.

The Inspectorates report that the percentage of successes in primary vaccinations amounted to 97 %, and in secondary vaccinations to 87·5 %.

The amount received in payment for vaccine issued was L.E. 606.

The cost of calves was L.E. 388, being the difference between L.E. 826 paid for 109 calves purchased and L.E. 438 realized by their sale after use.

(iii). Antirabic Institute.

The following notes are abstracted from the Report of Dr. Bain, the Director of the Institute. It will be noted that Dr. Bain has introduced an intensifying process which so far as can be judged by the experience of one year, has met with some measure of success.

"During the year 694 people (67 more than last year) have been treated at the Institute, as shown below :—

	1908.	1909.		1908.	1909.
January	30	53	July	74	58
February	47	48	August	75	46
March	52	63	September	42	73
April...	44	66	October	51	48
May	62	52	November...	32	65
June	72	66	December	46	56

"Of the 695 people treated, 534 were Egyptians, 112 were Europeans living in Egypt, and the remaining 48 were foreigners from Palestine and Syria.

"Considered geographically, the distribution of hydrophobia is as follows :—

Provinces or Governorates	Number of people bitten.		Provinces or Governorates	Number of people bitten.	
	In 1908.	In 1909.		In 1908.	In 1909.
Cairo	62	96	Beni Suef	9	24
Alexandria	29	55	Fayum	18	17
Suez Canal Governorate (Port Said and Ismailia) ...	20	23	Giza	25	15
			Minia	25	24
Behera	24	42	Assiut	40	36
Sharkia	70	43	Girga	15	23
Kaliubia	43	21	Kena	7	18
Dakahlia	45	45	Aswan	6	4
Gharbia	113	84	Syria and Palestine	36	46
Menufia	40	76	Abyssinia...	...	2

"Of the above the number of people bitten was :—

	1908.	1909.
by dogs	558	610
by cats	29	46
by jackals	2	...
by wolves	30	21
by donkeys	...	5
by pigs	...	1
by rats	...	1
by monkeys	3	6

Position of bites :—	1908	1909
On the head...	73	70
On exposed parts...	248	298
Through clothing	306	326

"Of this total of 694 people, it is necessary to subtract 82, whose treatment was not continued, as the animal by which they had been bitten was (after an observation of at least 10 days) found to be free from hydrophobia. It is therefore necessary only to consider the 612 people remaining. Of these, 8 were bitten by animals proved by microscopic examination and by experiment to have hydrophobia. The bodies of the animals which

bit these eight people enabled a positive diagnosis to be made, based on examination of the brain, investigation of Negri's "bodies," on characteristic lesions, and on inoculation of other animals with the disease.

"Sixteen animals that bit 49 people were notified by the veterinary service of the Alexandria Municipality as being affected by rabies, in addition to two others, that bit three people, suspected.

"In 22 cases in which for certain reasons it was impossible to conduct a post-mortem examination of the animal, clinical enquiry or reports of veterinary surgeons have left no doubt that they were cases of rabies ; in eight of these, it was the death of the person bitten that confirmed the diagnosis.

"85 animals were after observation declared to be non-infected, 185 bodies of animals that were sent up for examination were so much decomposed that no examination was possible.

"132 animals escaped after biting people, and were not identified.

"45 were killed, but instead of being sent to the Antirabic Institute for examination were either buried or otherwise disposed of through the ignorance of the people concerned.

"With regard to the remaining animals that have bitten people, of some we have been able to obtain no information ; others have not been positively diagnosed as cases of rabies either because they were found definitely to be unaffected, or because their examination is not yet complete (at the time or writing), or because there was not time to carry out the examination to its conclusion.

"I have thought it advisable this year to modify to some extent the method of treatment. The comparative high mortality of 1908 (total 3·31 %, corrected 1·08 %) has indicated that the vaccine used should be strengthened. Until last year I dried the marrow used for the purpose at 23° C. in the dark, as is done at the Pasteur Institute, but instead of commencing the treatment with marrow that was fourteen days old, as is done there, I commenced with marrow that was five days old only. Moreover, whilst at the Pasteur Institute, marrow fresher than 3 days old is not used, I used finally one-day-old marrow, that is, almost perfectly fresh.

"This year, I have replaced this method by that of dilutions, which I perform, not with absolutely fresh marrow, but with ones that have been preserved for 5 days in neutral glycerine, of 30 Beaumé, in the ice-box.

"I have also replaced the 5-day old marrow by an emulsion (No. 5), representing $\frac{1}{6}$ of a centimetre's length of marrow for 5 c.c., of water. The weight of a centimetre of marrow being approximately 125 milligrammes * this emulsion represents approximately a strength of 1 in 240.

"The 4-day old marrow is replaced by Emulsion No. 4, i.e., $\frac{1}{5}$ c.c. of marrow in 5 c.c. of water, making the strength of the emulsion about 1 in 200.

"The 3-day old marrow is replaced by Emulsion No. 3, $\frac{1}{4}$ c.c. of marrow in 5 c.c. of water, making a dilution of 1 in 160.

"The 2-day old marrow is replaced by Emulsion No. 2, $\frac{1}{3}$ c.c. of marrow in 5 c.c. of water, making the strength of the solution about 1 in 120.

"Finally, the 1-day old marrow is emulsified in the proportion of 5 c.c. in 5 c.c. of water, making the strength about 1 in 80.

---

* The weight of the rabbits used never exceeds 1,500 grammes.

"On the sixth day I again give Emulsion No. 4 or 5, then Nos. 1 and 2, and recommence the series during 15, 18, or even 21 days, according to the gravity and the position of the bite. In this connection the character of the bites can be divided into three classes :—

"1. Those on the head, which are the most serious (particularly those on the face).

"2. Those on exposed parts of the body, other than the head.

"3. Those through the clothing.

"For all cases in the first of the above classes, and for many of those in the second, I have combined treatment by vaccination and injection of serum. During the first three days of treatment, I make an injection of 5 c.c. of the following mixture :—

"One part of 10 % emulsion of fresh marrow in normal saline solution with 2 parts of antirabic serum. The patient then receives Emulsions Nos. 4, 3, 2, and 1.

"There have been five deaths among the patients treated.

"In the following table are given particulars of these, including name, date of being bitten, date of death, etc.

TABLE SHOWING DETAILS OF PEOPLE WHO HAVE DIED AFTER ANTIRABIC TREATMENT.

No.	Name.	Residence.	Date of being bitten.	Position of bite.	Number and gravity of bites.	Animal.	Length of treatment.	Date of death.	Place of death.
1773	Abdel Fattah Moursi.	Zerba Sennuris.	7 April 1909.	Corner of left eye, right jaw and right hand.	2 serious, 5 deep.	dog.	*21 days*, 10 April to 30 April 1909.	19 May 1909.	Zerba Sennuris.
2024	Zahia, bint Mahmoud.	Mehalla town.	26 Aug. 909.	Forehead.	4, of which 3 very serious.	dog.	*21 days*, 27 August to 16 Sept. 1909.	2 Oct. 1909.	Mehalla town.
2028	Magoura bint Ismail.	Mehalla town.	26 Aug. 909.	Right hand and wrist, left arm, right breast.	12 deep, 7 scratches. 1 serious.	dog.	*21 days*, 28 August to 17 Sept. 1909.	12 Oct. 1909.	Mehalla town.
2029	Sayeda bint Ali.	Mehalla town.	26 Aug. 909.	Right hand and fingers.	4, of which 2 serious.	dog.	*21 days*, 28 August to 17 Sept. 1909.	14 Oct. 1909.	Mehalla town.
2176	Mahmoud Mohamed.	Shibin town.	10 Nov. 909.	Left cheek and nose.	2 very serious.	dog.	*21 days*, 11 Nov. to 1 Dec. 1908.	23 Dec. 1909.	Shibin town.

"In this table, following the method observed in other Institutes similar to this, only those deaths are included which have taken place more than 15 days after the bite, as the immunity conferred by the treatment is only acquired after lapse of this time.

"Deaths occurring before 15 days are due to the severity of the virus, the gravity of the bites, or to delay in the patients being brought to the Institute for treatment, and should not be included in the statistics showing deaths after treatment.*

"As there were 612 persons treated, these five deaths give a proportion of deaths equal to 0·81 %.

"The total number of deaths also includes 7 other deaths that occurred either during treatment, or in less than 15 days after the bite.

"There now remains only to specially notice certain facts with reference to this report.

"First, it is noticed that 67 people more than last year were treated, which would cause one to believe that rabies was on the increase, in the country. However, this number must be reduced by 12, the increase in the number of strangers treated. This number, which was 21 in 1906, and 22 in 1907, has risen to 36 in 1908, and to 48 in 1909. With the exception of 2 cases from Abyssinia all the cases from abroad are from Asia Minor.

* REMLINGER. *Bulletin de l'Institut Pasteur,* Vol. II, Nos. 19 and 20 (October 15 and 30).

"The number of people bitten in the face is about the same as in 1908. * The number of bites on exposed parts is 50 more than last year. † In spite of this, the number of deaths is considerably diminished; ‡ this I consider must be due to the strengthening of the vaccine used, and I shall without doubt be led to still further strengthen it."

(iv). Khedivial Chemical Laboratory.

This, which is one of the earliest establishments of the Department is still of a somewhat rudimentary and insufficient nature. It greatly needs reconstruction and enlargement.

The present work is limited to the examination of samples of food products, medicaments or commercial materials sent up by the sanitary or the police authorities as well as by other interested parties; but the question of a serious and regular control of alimentary products is a pressing one, and the usefulness of this laboratory could in this connection be made a very real one. The legal provisions regarding adulteration of food are far from satisfactory; they exist in certain articles of the Penal Codes, Egyptian and Mixed, and are not parallel, so that though it is sometimes possible to obtain a deterrent punishment in the prosecution of a local subject, the European is amenable only to minor penalties which cannot be regarded as exercizing a deterrent effect unless, however, the circumstances of the case bring it within Consular jurisdiction when the higher penalties for misdemeanour may be invoked. On this subject the law requires amendment, and pari-passu with constructive legislation progress should also be made with constructive development of the laboratory and its personnel.

The following Table XXXII gives the résumé of analytical work done during 1909.

TABLE XXXII.

Analyses made at the Khedivial Chemical Laboratory, 1909.

Butter	167	Milk	99
Medicaments	364	Water	1
Wine	2	Wax	2
Oil	7	Petroleum	2
Alcohol	1	Flour	38
Soap	30	Narcotics	18
Rice	1	Silver wire	1
Mineral	1	Depilatories	6

(v). Serum Institute.§

This establishment is under the immediate direction of Dr. White.

During the first four months of the year, the work of the Institute was continued, with a maximum of 300 serum producing animals.

This number was reduced to 100 during the period of May 2nd to July 16th.

From this period onwards the work has been continued with a maximum number of serum producing animals of 100.

	1908.	1909.
* Number of people bitten on the head	73	70
† " " " " " other parts of the body, exposed	248	298
‡ Total mortality	3·31%	1·96%

§ A detailed report of the organization and methods of this institute—first founded in 1903—is now in the printers, hands.

As formerly, regular supplies of Cyprus * animals were imported. These animals were inoculated with cattle plague and were used for the production of virulent blood.

The number varied according to the requirements; the average number throughout the year being 8 per week.

The total number of animals (Egyptian and Cyprus), on the first of each month was as follows :—

January	332	July	141
February	328	August	113
March	305	September	124
April	306	October	128
May	327	November	122
June	227	December...	129

Of the serum producing animals 9 died; the results of the post-mortem examination were as follows :—

Purpura	2	Shock (after reinforcing) ...	1
Toxæmia	1	Rupture of blood vessel ...	1
Jaundice	1	Miliary tubercle	1
Cachexia	1	Broncho-pneumonia	1

During the period of reduction 198 bulls were killed and their blood used for the production of serum. Of these, 192 carcases were sold and 6 were condemned; of the latter, 5 were condemned for tubercle and 1 for cachexia.

Of the Cyprus cattle, 8 died or were killed, the post-mortem findings being :—

Cattle plague	1	Tubercle	1
Cattle plague complicated with stiff sickness	3	Fracture of femur	1
Cattle plague and pneumonia	1	Experimental (stiff-sickness)	1

The number of reinforcements and the number of Cyprus animals used for the virulent blood necessary were as follows :—

1909.	Bled.	Reinforced.	1909.	Bled.	Reinforced.
January	40	139	*Brought forward...*	236	783
February	43	130			
March	53	175	August	14	49
April	36	150	September	10	33
May	28	91	October	20	60
June	16	49	November	15	46
July	20	69	December	15	49
Carried forward...	236	783	Total ...	310	1,020

* It is necessary to use Cyprus animals in order to avoid meeting the possible active or passive immunity which may be found in Egyptian cattle.

The number of bleedings and the amount of serum sent to the Department were as follows :—

1909.	Number of bleedings.	Amount of serum in litres.	1909.	Number of bleedings.	Amount of serum in litres.
January	555	799·9	*Brought forward...*	3,180	4,894·45
February	540	657·6			
March	574	766 0	August	199	363·3
April	589	818·5	September	175	320·7
May	441	858·75	October	167	309·75
June	306	584·5	November	202	338·4
July	175	409·2	December	211	374·7
Carried forward...	3,180	4,894·45		4,134	6,601·3

The above table represents the routine work and does not include the serum produced by the animals which were bled during the period of May 2nd to July 16th. These animals, 198 in all, gave 4,777·5 litres of blood which yielded 2,085·5 litres of serum.

The total amount, therefore, of serum produced during the year, was 8,686·8 litres. This represents an output of 173,736 doses of 50 c.c. each.

With regard to the health and condition of the animals, nothing of a serious nature occurred to interfere with the production of serum. An outbreak of "stiff-sickness" occurred during the period of August 30th to October 9th. At first it was feared that it would be necessary to stop the production of serum for the time being. However, after certain experiments the work was continued; careful attention being paid to the time elapsing after each attack.

In all, 54 of the total number of 120 animals suffered from an attack of this disease. No deaths occurred among the serum producing animals; three of the Cyprus animals died, the disease being super-added upon cattle plague.

The time during which the outbreak lasted was not sufficient to allow of an extended investigation of the disease. However, certain experiments were carried out, partly at the Hygienic Institute and partly at the Serum Institute, the former together with the co-operation of Dr. Todd, the latter with that of Mr. Allen. The results of these experiments although not by any means confirmatory nor definite, may here be noted, in case a similar outbreak may at any future time appear, when it would be possible to continue investigation.

With regard to the cause of the disease, nothing could be obtained from an examination of films made from the nasal discharge and from the blood.

The following experiments were carried out :—

1. Six bulls were each inoculated with 5 c.c. unfiltered blood drawn from a bull suffering from the disease and in its second day of fever. Of these six, three were affected in 24 hours, one in six days, and two remained unaffected.

As it was impossible to isolate the animals completely, and as possibly the three affected animals were developing the disease at the time of inoculation, this experiment was repeated.

2. Ten bulls, which had not yet been affected and two which had already had an attack and had recovered, were inoculated as above.

None of these animals showed any signs of infection. By this time the outbreak had practically died out, so that the risk of outside infection was more or less eliminated.

3. Ten bulls and two sheep were inoculated with infected blood which had been passed through an ordinary Berkfeldt filter.

The result was negative, none of the animals showing any signs of the disease.

4. Four sheep were inoculated with unfiltered infected blood. The result again was negative, although one of the sheep showed a temperature rise on the fifteenth day. There were no other symptoms indicative of the disease.

5. A camel and a horse were also inoculated with unfiltered blood, but showed no reaction.

From these experiments it would appear that the disease cannot be communicated by direct inoculation of blood of infected animals, although confirmatory tests remain still to be established, as it appears from the reports of the disease in Rhodesia, that certain inoculation experiments had been there successful, having given a positive result.

The serum produced during the outbreak was specially set aside and not allowed to be issued until experiments were carried out to prove its non infectivity. Samples were taken and fresh Cyprus animals were immunized with it in the usual way. The results, as were to be expected from the above experiments, were entirely negative, so that the serum produced during this period has been passed as being suitable for general use.

As comparatively little seems to be known of this disease in Egypt, Mr. Allen, the veterinary surgeon at the Institute, made careful clinical observations of the cases, the results of which ~~were~~ are recorded under the Veterinary section.

In addition to the production of cattle plague serum the Institute has afforded valuable opportunities for research in several directions and in cooperation with the work in the Hygienic Institute of which indeed it forms an essential annex.

In view of the increasing importance of serum study it is of the highest necessity that this Institute should be maintained in an efficient state and on an adequate basis, for it is confidently considered that with proper means of research at hand considerable results of value and interest will be realized.

(vi) Original Investigations.

Pellagra.

This disease owes its importance to the fact that it is one of the chief factors in the production of insanity in this country; and that it is believed to be specially prevalent amongst the population of the Delta provinces.

Attention was first called to its existence amongst the fellaheen of Egypt in 1893 by Dr. F. W. Sandwith, at that time physician to the Kasr el Aini Hospital. At first it was looked upon more in the light of pathological curiosity than as a matter of economic importance, but owing to the later contribution to the subject by Dr. Warnock, in his reports on the Lunatic Asylum, interest was renewed, and the attention of the Government was more definitely drawn to the matter.

In 1907 a discussion took place as to whether the legislative measures adopted in Italy should not receive consideration with a view to their application in this country.

The Department deprecated any precipitate action in this direction, basing its view on the fact that little or nothing was known of the causation of the disease, of its distribution

in the country and still less of the results obtained by the Italian law in reduction or suppression of the disease. The Department advocated careful investigation of :—

1. Its distribution and clinical features as may be noted in Egypt.

2. Its causative factors, for though the majority of writers were in favour of attributing it to the ingestion of diseased maize, others leant toward a theory of a protozoan blood infection, and the question could not therefore be said to have emerged from the controversial stage.

It was considered that before anything further were done it was necessary to develop fixed ideas on these points.

Consequently, it was decided to entrust Dr. White with an investigation on these lines, and detailed instructions were issued accordingly, not omitting to draw attention to the importance of studying the protozoan as well as the maize theory.

The enquiry was unfortunately interrupted by administrative exigencies, but Dr. White was able to furnish a preliminary report, and it is hoped that he will soon be in a position to resume the investigation.

Dr. White writes as follows :—

" I have the honour to submit to you a report on the investigation so far carried out on the occurrence of pellagra among the fellaheen.

" Those investigations have been devoted :—(1) To a study of the cases as seen at the Lunatic Asylum, Abbassia. (2) To visits to the villages and houses of the patients. (3) To a minute examination of well marked cases in Zagazig, and (latterly) in Benha. (4) To carrying out certain experiments.

" With regard to No. 1, Dr. Warnock very kindly gave access to the cases and the books of the Asylum. He also rendered valuable assistance in the way of suggestions and books of reference.

" On his suggestion, Sharkia—the province giving the greatest returns of such cases to the Asylum—was chosen as the most suitable place in which to begin.

" At the Asylum, also, where a room was set aside for the purpose, some pathological work has been done, and material collected from autopsies on typical cases.

" Experiments are being performed on the effects of inoculation of cerebro-spinal fluid obtained in such a manner.

" Experiments on cerebro-spinal fluid obtained by lumbar puncture still remain to be performed.

" With regard to No. 2, the methods of drying, storing and cooking durra have been noted in the different markaz towns, as well as in several villages of Sharkia ; samples of bread and durra were taken for further investigation, either in the way of chemical analysis or for experiments on animals.

" At the same time patients were examined, and suitable ones chosen for further examination in hospital.

" A similar procedure is proposed for the province of Qaliubia.

" With regard to No. 3, for purposes of investigation, patients were brought to hospital in order to be under closer observation. In all, 16 cases have been so examined, of these only two remain.

" In Benha hospital, where a beginning has been made on similar lines, there are now 5 cases under observation.

" With regard to the Zagazig cases, for various reasons, 10 were found unsuitable for investigation and were discharged apparently cured, either with or without treatment other than hospital diet and hygiene. The remaining 6 had their diet or treatment varied, in order to observe any change in their condition.

" One boy, 10 years of age (photos 1 and 2), had no treatment other than 3 months' residence in hospital, in which time his weight increased by 4 kilos, and diarrhœa practically disappeared; he had no medicinal treatment. His rash completely disappeared, although on admission he was one of the most marked cases. He has been discharged, but his further progress must be watched. He has been ordered to report himself regularly.

" Five cases who had shown improvement on the ordinary hospital diet were at varying times for varying periods put on durra bread, instead of the ordinary wheaten bread of the hospital. The durra bread used was made from durra obtained from a native house, and was prepared from time to time in the usual way by a native woman. The changes, under these conditions, were in some instances marked, being of the nature of a toxœmia. There was noted return of diarrhœa, loss of weight, dull and listless appearance, with clayey colour of skin. There was no return of the rash, however; possibly neither the length of time nor the conditions favoured its return. This is a point worthy of further investigation.

" Some cases showed distinct improvement on soamin. No conclusion, however, can be drawn, as others showed a similar improvement without any medicinal treatment.

" It would be an interesting further stage of the investigation to live in one of the villages largely affected, as for instance, Minet el Gamh, Patients could be treated there whilst living in their houses, so that the effects of hospital diet and hygiene could thus be eliminated.

" One case, age 25 (photo No. 3), deserves special attention. This patient was for the first 11 days of his stay in hospital on hospital diet from which maize is excluded. He improved in condition, and was put on durra bread for 3 weeks; but his symptoms became so marked that at the end of that time the hospital diet had to be renewed. During the 3 weeks of durra bread, he lost 2·3 kilos in weight; he has now been two months on hospital diet, and has put on 5·2 kilos. During the period when he was having durra bread, he fell off markedly in condition, his skin became dark, but no rash appeared, and the diarrhœa increased. He also developped delusions, but they have now disappeared, and his mental and physical conditions have much improved.

" Another case, age 13, while still on durra bread continued to increase in weight; but his other conditions were marked, namely, dull and depressed state, with toxœmic symptoms. After the durra bread was stopped, he became much brighter in appearance, and his colour began gradually to improve.

" A point worthy of note, and one which markedly complicated the clinical picture in the cases observed, was the fact that all the cases specially under observation in the Zagazig hospital suffered from Bilharziosis, whilst all, with three exceptions, suffered also from Anchylostomiasis. This point is of great interest, and may possibly have some bearing on the fact that patients fell a victim to the disease whilst their brothers and sisters, living under similar conditions, escaped.

" With regard to No. 4, namely experiments, much remains to be done.

" On the hypothesis that decomposing durra has to do with the causation of pellagra, animals were fed on such durra—whilst others were fed on healthy durra as controls.

Fig. 4

Fig. 5

Fig. 1

Fig. 2

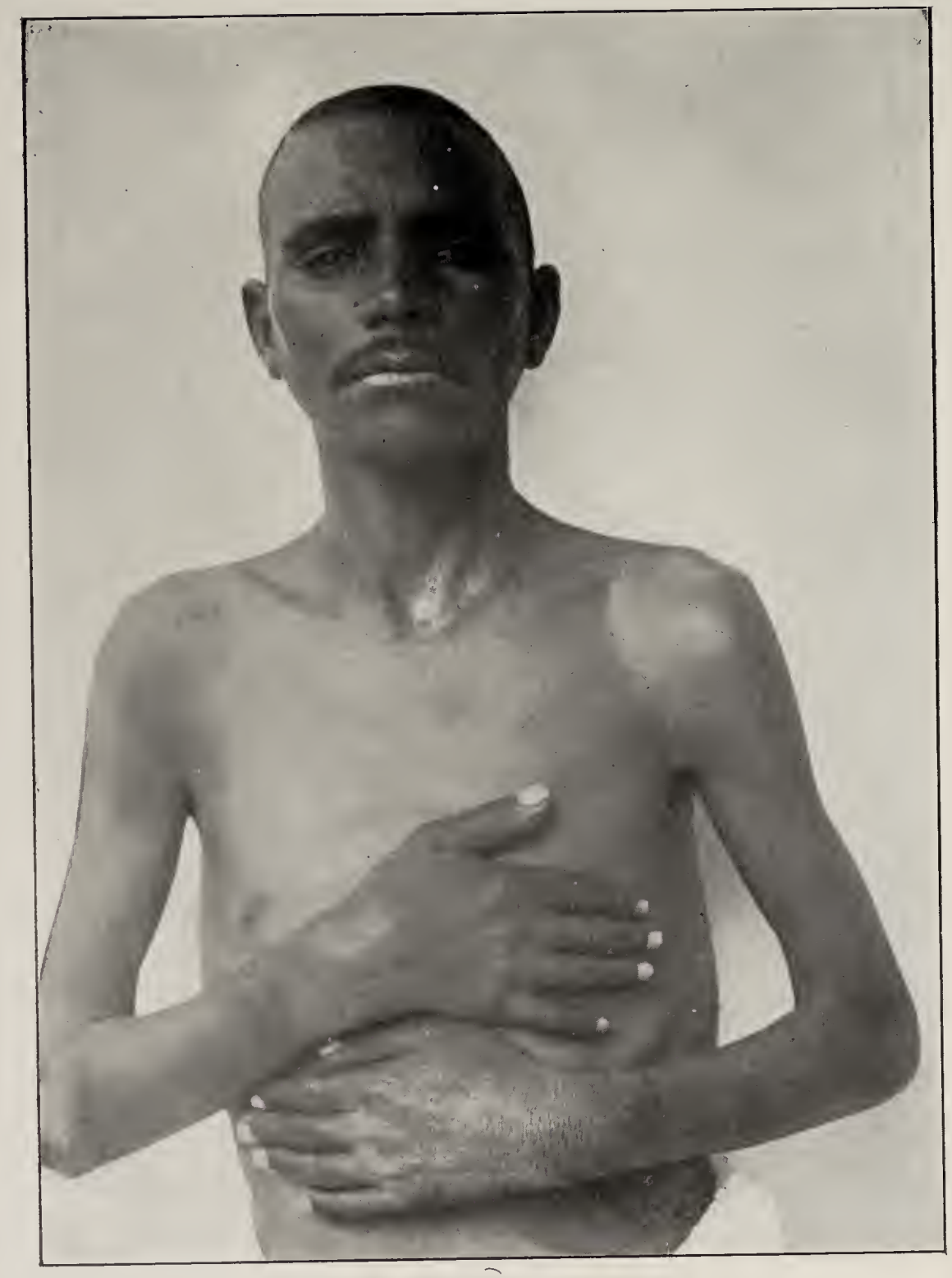

Fig. 3

Fig. 6

"In the case of chickens, there seemed at first to be a stunting of the growth of those fed on the diseased grain; whilst others, from the same nest, thrived on good grain. However, after a time the former birds seemed to get accustomed to the damaged grain, possibly due to the establishment of a tolerance for the toxine (if such be present), or the grain was less damaged than formerly, so that the birds seemed able to thrive on it.

"In the case of rabbits, under similar conditions, two that were fed on damaged maize showed a distinct difference from the controls that were fed on good grain—the difference in weight in one case being 80 grammes. The difference in their coats was marked—in the case of the former they were turned and staring, whilst the latter were smooth and normal.

"Bread made from damaged grain is being analysed, to see, if possible, whether or not some extract can be obtained, of the nature of an alkaloid; the moulds are also being identified, so that, if possible, they can be artificially grown, and so obtained pure for purposes of further experiment and investigation.

"It is impossible, at such an early stage of an investigation of this nature, to draw any definite conclusions.

"Of the many theories put forward as the cause of pellagra, the maize one, from the great support it has received, has been given first place. At the same time, attention has been paid to other theories (e.g., the protozoon one), and blood films have from time to time been examined.

"Judging from the work so far done, one feels only justified in saying that at least damaged maize, as found in some of the villages, and presumably used for food purposes by the poorer fellaheen, seems to cause a condition of the nature of a toxœmia. Whether this is due to some poison elaborated by a fungus growth in the durra grain, or to the fungus itself, only further research can decide.

"Judging from the experience so far gained, the following would seem to be the best lines upon which to continue this research:—

"1. That a continued minute examination be made of typical cases, over a lengthened period of time, at the homes of the patients as well as in the hospital.

"2. That the different provinces be visited, both in Upper and Lower Egypt, so that the differences in prevalence may be compared with the different conditions, either as to the nature of the durra, of its process of drying, storing and cooking.

"3. That the attention of Markaz medical officers be drawn to the subject, so that through their barbers an estimate be made of the prevalence of the condition in Egypt. This has already been done in the case of Sharqia, the numbers, however, remain to be checked.

"4. That further blood examinations, also experimental tests and chemical analyses, be carried out.

"5. That an extended study, over a lengthened period, at all times of the year be made, so that the difference in incidence and various stages of the condition be noted.

"Many difficulties have had to be overcome, owing to the reticence of the natives, their ignorance of the true significance of the disease and their fear of any interference.

"At first great difficulty was experienced in obtaining true histories of the cases and of the duration of the illness. Later, when the confidence of the villagers had been gained, this difficulty diminished. It is hoped that the return of the patients cured or improved to their villages will strengthen their confidence and make it easier for further investigation."

Leprosy.

The question of leprosy in this country has attracted at various times the attention of the Government, but it has not yet been found possible to devote sufficient study to the subject in order to determine a fixed plan and policy.

The administrative difficulties of dealing with it on an adequate scale are very considerable, and it is this fact which probably accounts for the insignificant degree to which this terrible disease has received official recognition.

Dr. Engel Bey, however, has devoted much time, study and enthusiasm to the subject, and last year attended (on behalf of the Wakfs Department) the Leprosy Conference at Bergen.

It is hoped that the Wakfs Department will be able to develop a scheme for the establishment of leper refuges, but it is obvious that such an undertaking will require much time for study and considerable funds for its support.

The following is a summary of Dr. Engel Bey's report on the Bergen Conference :—

" The Second International Conference on Leprosy was held at Bergen (Norway) in August, 1909. This town was chosen on account of its associations with the study of the disease, which date back to 1410, when St. George's Hospital was founded here, as a Lazar House. This hospital is still in existence, after having passed through many vicissitudes.

" Dr. Hjort (1832) studied here the difference between leprosy and syphilis. Danielssen and Bock compiled their celebrated treatise in 1847 at the same place.

" In 1850 a " Médecin Supérieur de la Lèpre " was appointed for the whole of Norway. Later Dr. Armauer Hansen occupied this post. It was he who first stated that leprosy was infectious, and he was also the discoverer of the leprosy bacillus.

" Since 1860, all cases of leprosy must be declared in Norway. In 1877, this was followed by a law ordering isolation of vagabonds infected with the disease. In 1885, " isolement obligatoire facultatif " was ordered.

" The success of these measures is shown by the fact that in 1856 there were 2,853 lepers known to exist in the country, while in 1907 the number was reduced to 431.

" *The Congress.*—Many specialists from all countries attended the Congress, officially opened by King Haakon on August 16th, 1909. From evidence laid before the Committee, the two following points stand out conspicuously :—

" 1. Leprosy can exist in any country, and is equally widespread as tuberculosis.

" 2. Leprosy is contagious, but it is not yet definitely known in what way it is transferred from man to man. (It is, however, probably *not* directly transmissible). Eye affection, and mutilation of the hands and feet, also experiments with serum were described and discussed.

" Methods of treatment, and the possibility of curing the disease, also occupied the attention of the Commission. Deyke Pasha prepared an injection termed " nastin," but though this cured in a certain few cases, and ameliorated the condition of others, in some it aggravated the disease, and even caused death.

" Dr. Engel described (with photographs) the effects of " anti-leprol," a purified form of chaulmoogra oil prepared at his suggestion and which he had found successful in treating leprous cases.

" The Permanent International Committee published certain theses on the subject,

which are attached ; the most important of these is one stating that LEPROSY SHOULD NOT BE CONSIDERED AS BEING INCURABLE."

(Dr. Engel states that this pronouncement confirms the views he set forth when as delegate of the Egyptian Government two years before, he was present at the International Congress of Hygiene at Berlin.)

With regard to the propositions made by the Conference, Dr. Engel does not recommend them in their entirety to be adopted in Egypt, chiefly on account of the large outlay that would be necessary ; but what should be adopted is the suggestion that *all* beggars and vagabonds affected with leprosy should be *strictly isolated*. As the Wakfs Administration is prepared to provide Lazar Houses, there seems no reason why this suggestion should not be made law.

If such a law were drawn up, it might also contain restrictions as to the occupations followed by lepers. No leper should make or sell cigarettes, or certain food stuffs, nor should any leper be allowed to be a " fiki " (village teacher), a servant, or a cook.

To demonstrate the importance of the subject, Dr. Engel adds that there are 6,500 lepers in Egypt (Census 1907).

The following are the principal propositions passed by the Second International Scientific Conference on Leprosy, Bergen 1909.

1. The Second International Scientific Conference on Leprosy confirms in every respect the resolutions adopted by the first International Conference of Berlin, 1897.

Leprosy is a disease which is contagious from person to person, whatever may be the method by which this contagion is effected. Every country, in whatever latitude it is situated, is within the range of possible infection by leprosy, and may, therefore, usefully undertake measures to protect itself.

2. In view of the success obtained in Germany, Iceland, Norway and Sweden, it is desirable that other countries with leprosy should proceed to isolate their lepers.

3. It is desirable that lepers should not be permitted to follow certain occupations which are particularly dangerous in respect to the contagion of leprosy.

In every country and in all cases the strict isolation of leprous beggars and vagrants is necessary.

4. It is desirable that the healthy children of lepers should be separated from their leprous parents as soon as possible, and that these children should remain under observation.

5. An examination should be made from time to time of those who have lived with lepers by a competent physician.

6. All theories on the etiology and the mode of propagation of leprosy should be carefully examined to ascertain if they accord with our knowledge of the nature and the biology of the bacillus of leprosy.

It is desirable that the question of the transmissibility of leprosy by insects should be elucidated, and that the possibility of the existence of leproid diseases among animals (rats, etc.), should receive early study.

7. The clinical study of leprosy induces the belief that it is not incurable. We do not at present possess a certain remedy. It is desirable, therefore, to continue the search for a specific remedy.

PART IV.—VETERINARY SERVICE.

(i) Contagious Diseases.

Rabies.—During the year 34 cases were reported as occurring amongst animals (30 dogs and bitches, 2 cats, 1 donkey and 1 wolf), against 46 cases during the year 1908. These cases were reported in the following Governorates and Mudirias :—

	1909.	1908.
Cairo	10	4
Alexandria	16	13
Girga	...	1
Assiut	...	2
Minia	1	...
Giza	1	4
Qaliubia	...	6
Sharqia	...	3
Gharbia	4	3
Daqahlia	...	6
Menufia	2	2
Behera	...	2
Totals	34	46

The muzzling order applied in Cairo and Alexandria is still in force.

During the year (1909), 2,773 dogs were seized by the Police and taken to the Dog's Home at Bulaq, against 3,373 during the year 1908.

These 2,773 dogs, together with 72 remaining from last year (1908), making a total of 2,845, have been disposed of as follows :—

Claimed by owners	352
Destroyed unclaimed	2,363
Sold	58
Died	28
Remaining on 31st December, 1909	44
Total	2,845

Besides the dogs sent to the Dogs' Home, the Police have destroyed 831 in Cairo and suburbs during the year 1909, against 2,074 in the previous year.

3,936 dogs and cats were seized in Alexandria during the year, against 3,784 in the year 1908. These animals have been disposed of as follows :—

Claimed by owners	385
Destroyed	3,420
Died	131
Total	3,936

The muzzling order, applied in Port Said since August 1906 has been rescinded by Arrêté Ministeriel dated 7th February, 1909, as no cases of rabies occurred in Port Said since 7th October, 1906.

In the Mudirias and Governorates 43,348 dogs were poisoned during the year, against 34,920 in the previous year.

Glanders.—165 cases of glanders were detected in Egypt during the year (including 10 cases detected in Alexandria quarantine stations), against 165 in the previous year and 143 in the year 1907.

The cases occurred in the following Governorates and Mudirias :—

Cairo	82
Alexandria	70
Port Said	2
Giza...	1
Alexandria quarantine stations	10
Total...	165

Mallein is used in every outbreak of glanders, and all solipeds arriving from Asia Minor, Turkey, Greece and the islands of the Levant, are tested in the quarantine stations on their arrival.

Epizootic lymphangitis.—8 cases of this disease were reported during the year, against 44 in the previous year and 47 in the year 1907.

These cases occurred as follows :—

	Died.	Destroyed.	Recovered.	Remaining.	Total.
Cairo	...	...	...	1	1
Port Said	...	2	4	1	7

Anthrax.—During the year 198 cases were reported : 159 in the quarantine pens, 14 in Alexandria Abattoir (amongst sheep), 22 in Cairo Abattoir (on sheep), 1 in donkey in Qaliubia Province, 1 sheep in Cairo City, and another sheep in Alexandria Town (near Abattoir).

The cases detected in the quarantine pens are distributed as follows :—

Alexandria, sheep and goats	158
Port Said, sheep	1
Total	159

During the year 1908, 388 cases were reported : 343 in the quarantine pens, 21 in Alexandria Abattoir, 21 in Cairo Abattoir, and 3 in Cairo City.

The following are the countries from which the cases reported in 1909 were imported :—

	Sheep and goats.	Donkey.
Asia Minor	178	...
Servia	13	...
Egyptian	6	1
Total	197	1

Black quarter (Charbon symptomatique).—20 cases of this disease were detected during the year in Port Said quarantine parcs : 19 in sheep and goats and 1 buffalo.

They are from the following ports :—

	Sheep and goats.	Buffalo.
Mersina	...	1
Alexandretta...	18	...
Tripoli	1	...
Total	19	1

Sheep-pox.—66 cases were reported during the year, distributed as follows :—

Alexandria quarantine parcs	53
Port Said quarantine parcs	4
Sharkia Mudiria	1
Menufia Mudiria	8
Total	66

In 1908, 251 cases were reported : 83 in Alexandria quarantine parcs, 136 in Port Said quarantine parcs, 13 in Sharkia Mudiria, 16 in Behera Mudiria, and 3 in Cairo Abattoir.

Foot and mouth disease.—No cases were reported during the year 1909.

In 1908, 4 cases were detected in Alexandria quarantine parcs, and 31 in 1907, in Port Said quarantine parcs.

Septicæmia hæmorrhagica.—During the year 18 cases were reported in the following Mudirias :—

Aswan	Mudiria	3
Girga	,, ...	2
Fayum	,, ...	6
Behera	,, ...	3
Gharbia	,, ...	3
Daqahlia	,, ...	1
	Total	18

In 1908, 70 cases were reported : 24 from the quarantine parcs of Alexandria and Port Said, and 46 reported in the country.

Pleuro-pneumonia.—No cases were reported during the past year nor in the year 1908.

Swine fever.—340 cases were reported in Cairo City, including 89 detected in Cairo Abattoir, during the year.

In 1908, 8 cases were reported in Cairo Abattoir during the month of December.

Prophylactic measures to prevent the spread of the disease are in force.

Mange.—6 cases were reported in Cairo during the year on 4 horses and 2 donkeys.

In 1908, 16 cases, on camels, were reported in Qantara quarantine parcs.

Strangles.—One case was reported from Alexandria quarantine parcs during the year.

Stiff sickness.—389 cases were reported during the year in the following Mudirias and Governorates :—

Aswan	60
Assiut	14
Giza	3
Menufia	22
Gharbia	46
Behera	108
Sharkia	1
Cairo	21
Alexandria	109
Canal	5
Total	389

The disease was first detected in May in Aswan Mudiria, and has undoubtedly prevailed throughout Egypt during the summer and autumn, causing very little damage. Deaths from this disease were very rare.

The following clinical note by Mr. Allen describes the disease as seen at the Serum Institute.

Clinical note on stiff sickness or three-day sickness as it appeared at the Serum Institute, Abbassia (August 30th to October 9th, 1909).

"The onset of the disease was sudden : characterized by a rapid rise of temperature to 40° C., or 40·5° C. There was a marked alteration in the breathing, which was quickened and abdominal in character. The chest was held fairly rigid, expiration being carried out with a "double lift." A constant feature in the cases was a mucous discharge from the nose, while a discharge from the eyes did not always occur. These symptoms are apparently somewhat at variance with the experience of Bevan in Rhodesia, where the most valuable initial symptom seemed to be a discharge from, and a swelling of, the eyes ; whereas at the Institute the alteration in the breathing was the earliest diagnostic aid. In this connection we may state also that the pulse, as felt in the cases here, remained fairly strong and was but little altered.

"Shortly after these initial symptoms—a matter of four or five hours—the characteristic feature of the disease developed, viz., stiffness. This condition was, in some cases. preceded by lameness on one or more limbs. The picture of the animal at this stage cannot be better described than in the words of Bevan : "The animal shows a disinclination to move and it only does so with great discomfort, and with the same amount of difficulty and with the arching of the back seen in horses suffering from laminitis." In some cases a loss of power in the hind quarters was noted, the animal swaying in its walk. There were no observable lesions to account for these symptoms.

"At this stage the mucous discharge from the nose became more marked, and some animals showed a thick yellowish discharge from the eyes. The pulse throughout remained fairly normal and was not altered so much as would be expected from the severity of the fever. The stiffness gradually increased, so that there was a distinct disinclination to get up. The muffle usually remained moist. The fæces were somewhat dry and mucous coated. in no instance was diarrhœa noted. Salivation was frequently excessive, and the buccal mucous membrane was congested or in extreme cases even ulcerated.

"In two or three days the fever and general symptoms subsided, but the stiffness lasted for four or five days.

"During the first two days the animals refused food, but rumination and feeding recommenced on the third day.

"A relapse occurred in one case only."

Animals' Isolation Hospital.

An isolation hospital for animals suffering from, or suspected of, contagious diseases, and especially for cases of suspected glanders, has been established at Abbassia.

This hospital was opened in June 1909, and up to December 31st, 57 cases have been admitted.

Horses	52
Mules	1
Donkeys	2
Cattle	2
Total	57

Diseases :—

Glanders	18 horses. 1 mule.
Suspected glanders	29 horses.
Mange	4 horses. 2 donkeys.
Epizootic lymphangitis	1 horse.
Fever	2 cattle (bullocks).
Total	57

Animals destroyed :—

Glandered	18 horses. 1 mule.
Mange	1 horse.
Total	20

(ii). Cattle Plague.

During the year, 1,998 deaths of cattle plague were reported in the following Mudirias and Governorates :—

Aswan	597
Kena	378
Assiut	6
Minia	114
Beni Suef	1
Fayum	57
Qaliubia	12
Sharqia	408
Gharbia	89
Menufia	3
Behera	226
Daqahlia	91
Cairo	5
Alexandria	1
Port Said	10
Total	1,998

This brings the total number of deaths reported in Egypt since the appearance of the disease, in June 1903, to 163,134.

35,966 animals were serumized in the infected districts during the year 1909 by native policemen trained as inoculators under the supervision of English and Egyptian veterinary surgeons.

Besides the cases that occurred in the interior of the country 10 cases were reported in Alexandria quarantine parcs and 17 in Port Said quarantine parcs.

During the year 1908, 8,355 cases were reported in the interior of the country, 48 cases were reported in Alexandria quarantine parcs, 18 in Port Said quarantine parcs, and 5 cases in Alexandria Abattoir.

On the subject of cattle and cattle plague in Egypt Mr. Littlewood has written a more extended note of which the following are the more important extracts.

" It will be seen above that 1,998 deaths from cattle plague (Rinderpest) were reported in 1909 as occurring amongst cattle and buffaloes in Egypt, against 8,355 in the previous year, showing a diminution of 6,357 deaths. These figures cannot be considered alarming, but so long as cattle plague exists in the country it is a standing danger to the cattle interests of Egypt. I consider that considerable progress has been made in the application of the restrictive measures during the past year, but Mudirs of Provinces and Mamurs of Markazes should, I think, be made personally responsible for the carrying out of cattle plague restrictions, as the application of these measures must not be considered a purely veterinary question, but an administrative matter of considerable importance, which, unless it receives the *very* active support of the Mudiria authorities, will suffer severely from the neglect. In some districts the law has undoubtedly been openly defied by bands of cattle dealers, butchers and others, who make considerable profit out of the sale of infected cattle and meat.

" It is always more difficult to deal with outbreaks during the time that cotton is being sown and the crops are being threshed ; the mortality is always high on these occasions, as the farmers delay reporting the disease until it has attacked several cattle and exposed a large number to infection, hoping against hope that the disease may disappear and that they will be able to finish sowing their cotton or threshing their corn without being interfered with by the authorities, as the application of cattle plague restrictions invariably delays agricultural operations. Every endeavour is made to interfere as little as possible with the working of the animals on these occasions, and after the cattle of a village are serumized, all, except those actually diseased, are allowed to work, although we are well aware that several cattle must have the disease in the incubative stage, and although serum has been injected, hard work will almost invariably produce fatal results. This loss, however, is small compared to the loss which might result to the fellaheen if their land was not prepared for the cotton crop or if their cereals were not threshed.

" The loss of cattle and buffaloes in 1908 and 1909 represents about 0·56 % and 0·14 % respectively of the total number of cattle and buffaloes in Egypt. These numbers cannot, I think, be considered as seriously affecting the agricultural interests of the country, but there is no doubt that the losses were severely felt by many owners, more especially those of the humbler class.

" The use of serum as a preventive against cattle plague has given satisfactory results ; 35,966 cattle and buffaloes were serumized during the year ; the buffalloes fortunately show a considerable immunity against cattle plague, and they are not in every outbreak

serumized. 28 non-commissioned officers of the Police are now trained to serumize animals under the supervision of the veterinary staff."

Cattle plague in the Sudan.

Cattle plague was reported from the following districts in the Sudan during the year :—
Kassala Province.
Bahr el Ghazal Province.
Kordofan Province.
White Nile Province.
Blue Nile Province.
No returns showing numbers of animals attacked, recovered or died have been received.

(iii) Abattoirs.

Three third class abattoirs at Beni Mazar, Abu Kerkas and Samallut (Minia) were opened during the year ; also one small abattoir at Mit el Amel (Daqahlia), which was built by the Markets Company and worked by that Company.

Up to the end of 1909, there are 104 towns (including Alexandria) provided with public abattoirs ; another abattoir is in course of construction by the Department.

List of abattoirs built by Government and worked by the Department of Public Health :—

Cairo.	Quesna.	Tema.
Ismailia.	Tura.	Foa.
Qaliub.	Port Said.	Kafr el Sheikh
Maghagha.	Helwan.	Beni Mazar.
Samallut.	Abu Kirkas.	
Nag Hamadi.	Zeitun.	

Kus abattoir is under construction.

List of abattoirs built by Government and worked by the Municipal and Local Commissions :—

Tanta.	Sennures.	Benha.
Zagazig.	Rosetta.	Zifta.
Fayum.	Simbellawein.*	Menuf.
Minia.	Dessuk.*	Mellawi.
Suez.	Esna.*	Giza.
Kena.	Belbeis.	Tahta.
Suhag.	Mansura.	Aswan.
Shebin el Kom.	Damanhur.	Abu Tig.
Mit Gamr.	Beni Suef.	Samannud.*
Kafr el Zayat.	Assiut.	Tala.*
Akhmin.	Damietta.	Beba.
Luxor.	Mehalla Kebir.	
Manfalut.	Girga.	

* These abattoirs were built by Government, worked by the Markets Company, and then transferred to the Local Commissions.

List of abattoirs built by the Government and worked by the Markets Company :—

Tukh.	Dekernes.	Delingat.
El Fash.	Ibiar.	Bush.
Kafr el Bagur.	Gaafaria.	Faccus.
Bassiun.	Ashmun.	Belifia.

List of abattoirs built and worked by the Markets Company :—

Mehallet Menuf.	Sobk.	Katama el Ghaba.
Missir.	Abnub.	Ibrahimia.
Ganzur.	Armant.	Abu Hommos.
Abul Shikuk.	Farshut.	Zerbi.
Sersina.	Bardiss.	Mashtul.
Saft el Meluk.	Geziret Shandawil.	Matai.
Sombat.	El Chine.	Sanhur.
Mit Yaish.	Mehallet Abu Ali.	Maragha.
Azizia.	Abu Kebir.	Kift.
Shalshalamun.	Batanun.	Bahgura.
Ibshewai.	Gezai.	Minsha.
Agamyin.	Beban.	Mit el Amel.
Shebin el Kanater.	Al Kanayat.	

Abattoir dues.

The revenue of Cairo Abattoir during the year 1909 amounted to L.E. 29,885, distributed as follows :—

	L.E.
Slaughtering dues	27,885
Stabling dues	1,197
Sheep market dues	1,036
Tripe-shops rent	216
	29,885

In 1908 the revenue of the Abattoir amounted to L.E. 28,399 ; thus showing an increase of L.E. 1,486·225 milliemes in the income of 1909 over that of 1908.

It is interesting to note that the slaughtering dues of Cairo and Helwan Abattoirs together in 1902 (under the Octroi), were only L.E. 14,070.

A still larger revenue from the Cairo Abattoir would, it is believed be realized if contraband slaughtering of the smaller animals could be stopped.

The total revenue of the 18 other principal abattoirs during the year 1909, amounted to L.E. 13,822·060 milliemes against L.E. 11,357·860 milliemes in 1908, thus showing an increase of L.E. 2,464·200 milliemes.

Animals slaughtered.

During the year 761,038 animals were slaughtered in the 20 principal abattoirs, against 724,082 in 1908, and 738,079 in 1907.

The following is a comparative statement of the different species of animals :—

	1909.	1908.	Difference (increase).
Cattle	173,135	141,901	31,234
Sheep and goats	576,297	571,011	5,286
Pigs	7,699	7,568	131
Camels	3,907	3,602	305
Totals... ...	761,038	724,082	36,956+

(iv) Census of cattle.

As regards the census of cattle and buffaloes Mr. Littlewood writes "this is taken yearly by the Mudiria authorities, but it is difficult to get them made out on fixed dates; August and September are the months in which the returns are called for, but it is frequently October or November before they are received. The figures, which must only be considered approximately correct are as follows for the last seven years :—

Years Aug.-Sept.	Cattle.	Buffaloes.
1903	959,669	718,023
1904	605,022	645,796
1905	655,156	708,233
1906	732,537	775,149
1907	778,896	761,486
1908	737,732	750,548
1909	725,116	728,284

"This shows a decrease of 12,616 cattle and 22,264 buffaloes in the census of 1909, as compared with that of 1908.

"The decrease may be accounted for by the facts that cattle markets and abattoirs have been opened over a larger area in 1909 than in 1908, 31,234 more cattle and buffaloes were slaughtered in 1909 in 20 of the principal abattoirs than in 1908, the total number (in 1909) being 173,135, of which 114,435 were *young animals and calves*, against 141,901 and 85,791 respectively in 1908; the imports of cattle show a decrease of 14,643; and further in 1908 forage was extremely scarce and naturally owners did not think it worth their while to breed or attempt to rear but a limited number of cattle. The question of forage during the summer months is becoming a very serious one, as cotton is cultivated on a much larger area than formerly, and it apparently pays to rear only a limited number of cattle. The breeders of cattle are generally the fellaheen, large farmers rarely breed cattle, but obtain their supplies for working purposes from the villages.

"The work of the Commission for improving the breeding of cattle in Egypt will, I think, be very difficult unless more forage is available during the summer months, and the larger farmer takes a greater interest in the breeding of cattle.

"Suitable cattle for agricultural purposes can now be purchased at from L.E. 18 to L.E. 22 per head, a slight increase on last year's (1908) prices."

(v) Importation of Animals and Meat.

The following are the numbers of animals imported into Egypt (excluding the Ṣudan) during the year 1909 as compared with those of 1908 :—

	1909.	1908.	Difference.
Cattle	28,846	43,489	14,643 —
Horses, mules and donkeys	1,990	1,989	1 +
Sheep and goats	273,604	424,917	151,313 —
Pigs, etc.	1,246	1,901	655 —
Camels	19,717	27,587	7,870 —
Totals... ...	325,403	499,883	174,481 —
			1 +
Net difference decrease			174,480 —

Mr. Littlewood writes as follows : " Cattle trade with the Sudan can hardly be said to exist or at least has only commenced ; the facilities which have been granted to the trade will, I hope, be increased as with a well organized Veterinary Department in the Sudan greater confidence is felt that the necessary regulations can be observed ; 138 cattle only were imported against 217 in last year ; a greater number would undoubtedly have been sent, but last spring and summer cattle were so cheap in Egypt, owing probably to scarcity of forage, that I advised cattle dealers to defer the trade until the autumn. Sudan sheep have now, I think, found a market in Cairo, 36,442 were imported against 28,066 in last year.

" In order to assist the trade, it might be advisable for the Sudan Government to reconsider the railway and boat charges, as if the cost of transport is too heavy, the dealers will be handicapped.

" 8,238 cattle were imported from Servia during the past year ; these are generally short legged animals of good quality and suitable for the Egyptian market. All these animals were slaughtered in Alexandria. Suitable quarantine sheds have now been erected on the quay at Salonica, and cattle can now be entrained in Servia and sent direct to these sheds, and from there sent direct by train to the ships ; under these conditions the Quarantine Board has decided, and I think quite rightly, to allow Servian cattle to be sent direct to Cairo Abattoir for slaughtering purposes. A Veterinary Official of the Quarantine Board will be stationed at Salonica to see that the above conditions are strictly enforced, and that all cattle leaving that port for Cairo are healthy."

Frozen Meat.

During the year 1909, the following quantities of frozen meat have been imported into Egypt :—

Nile Cold Storage Company.

Beef	386,042	lbs.
Mutton	140,490	„
Lamb	47,604	„
Veal	5,386	„

Wills & Co.

Quarters, Beef...	10,816
Mutton carcases	8,057
Lambs carcases	1,400
Veal carcases	193
Pork	213
Sundries packages	442

(vi). School of Veterinary Medicine.

On the 1st of January 1909 there were 39 students in the School. 14 students were admitted on October 1st, 1909.

At the Professional Examinations held in May and December 1909, 5 students of the Final year passed the examination and obtained their Diplomas.

During the year 9 students of the 1st Year resigned, one discharged from the Final Year and one from the 1st Year.

There are at present :—

2	students	in	the	4th	Year
6	„	„	„	3rd	„
14	„	„	„	2nd	„
15	„	„	„	1st	„

Out of the above the undermentioned are cadets from the Egyptian Army :—

3	in	the 2nd	Year
2	„	„ 3rd	„
1	„	„ 4th	„

The total number of veterinary surgeons qualified since the school was opened is 29 ; 6 entered the Sudan Service, 2 the Municipality of Alexandria, 2 are in private practice in Cairo, 17 in the Department of Public Health, 1 in the School of Agriculture and one qualified as Doctor of Medicine in America is at present practising in Cairo.

(vii) Veterinary Legal Cases.

According to reports received 266 examinations in veterinary legal cases have been made by Veterinary Inspectors of this Department ; of these 122 were cases of poisoning, 63 cases of wounds, and 81 cases due to accidents and common diseases.

According to returns received from the Chemical Laboratory of the School of Medicine, up to the end of October 1909, 93 organs were analyzed for poisoning, of which 73 cases were found positive and 20 negative.

PART V.—ENGINEER'S SECTION.

The Engineers Section is concerned with :—

1. The water and sanitary installations of public buildings and offices, and mosques and public baths.

2. The construction of hospitals, disinfecting stations, offices, stores, abattoirs and other buildings pertaining to this Department.

3. The repairs of the departmental buildings.

4. The examination and approval of plans and specification for sanitary dispositions and installation under the " Etablissements Insalubres " Decree.

5. The work connected with filling in of birkets.

6. The work connected with delimitation of cemeteries.

Price Bey, the Chief Engineer, reports as follows on the work of his section for the year 1909 :—

" A list of the various works undertaken by the Engineering Department during the year 1909 is herewith submitted :—

Lunatic Asylum.—In continuation of the programme as originally laid down, the following buildings have been completed and occupied during the past year :—

1. Section XXIII New pavilion to accommodate 60 patients, together with a workshop (which owing to the crowded nature of the Asylum is at present being used for the accommodation of patients), including sanitary and hot water installations and electric light.

2. New first class female villa, and porter's lodge, boundary wall, hot and cold water installations and electric light.

In addition to the above, arrangements for heating cells by hot water during the cold months have been fixed in Sections I, VIII and XV.

Considerable repairs were also made to the male villa, new washing up troughs fixed in kitchen, baker's oven taken down, repaired and refixed in position. Lignolite floors were laid in three cells as a substitute for the original ones in wood, which had become rotten through continual washing.

Several repairs were also carried out where absolutely necessary, to the old wards and buildings.

The cost of the foregoing work amounted to L.E. 8,975.

Plans and particulars were also prepared for an additional section (XXIV) for a further 60 patients. The contract for the work has been let, and the work is proceeding and will be complete in 1910.

Central Administration.—The first portion of the new Stores for the Central Administration has been completed and occupied during this year, at a cost of L.E. 2,817·829 milliemes.

Plans and particulars were also prepared for approval for carrying out the second portion, as originally proposed, but the credit for the work has not yet been granted.

Alexandria hospital.—The foundations of the residences for the Principal Medical Officer were completed during the year, and the superstructure commenced, which will be finished and taken over early in 1910.

Ophthalmic hospitals.—The work in connection with the superstructure of Assiut Ophthalmic Hospital has been proceeded with and is expected to be completed and occupied during 1910.

Plans and particulars were prepared for an ophthalmic hospital at Mansura and approved by the Projects Commission.

The work was put up for adjudication, but the decision as to commencing the work has been postponed until 1910. *

General repairs.—The following hospitals were repaired, repainted, and colour washed throughout :—

Aswan, Sohag, Minia, Beni Suef and Fayum, in Upper Egypt, and Zagazig and the Sisters Residence attached to Kasr el Aini Hospital, in Lower Egypt.

Minor repairs and renovations were also undertaken at the following buildings :—

Kasr el Aini Hospital, Hod el Marsud, Abdin Sanitary Office, Abbassia Infectious Hospital, Giza Health Office, Alexandria, Chatby, Port Said, Suez, Mansura and Tanta hospitals. and the Esbekia latrines.

Abattoirs.—Modifications and repairs were carried out to the abattoirs in the following towns :—

Government abattoirs.—Cairo, Port Said, Beba, Galiub, Helwan, Nag Hamadi and Zeitun.

Market abattoirs.—Bassiun, Bush, Fachn, Belefia, Esna, Ibyar, Achmun, Tala, Dessuk, Samannud, Simbellawein, Tukh, Faccus, Dekerness, Kafr el Bagur, Gaafaria, Delingat and Beba.

Cemeteries.—A sum of L.E. 1,405 has been expended in enlarging the Mohammedan and Catholic cemeteries at Port Said, and at Suez and Beba enclosure walls have been built at a cost of L.E. 97.

Sanitary installations to Government buildings.—Plans and particulars of the sanitary and water installations of some twenty Government buildings have been submitted by the State Buildings Department, and after examination (and modification when necessary) have been approved.

An arrangement has been made, by which the work will be inspected by the Department before being taken over.

Mosques, etc.—Thirty-two mosques belonging to the Wakfs Administration, and seventeen belonging to private owners, five baths, and five private houses were submitted to the

---

* This work is now in progress. June 1910.

Department, and after examination (and modification when necessary) were approved during the year.

Etablissements Insalubres.—Sixty-eight Etablissements Insalubres have been examined and approved after modification when found necessary, during 1909.

In connection with the repairs fund of the Department's Budget it may be remarked that the total sum allotted is L.E. 7,000, of which L.E. 2,000 is ear-marked for abattoirs, thus leaving a balance of L.E. 5,000 for other buildings. These other buildings, as may be seen by reference to the following Table XXXIII, amount in value to some L.E. 500,000 ; the repairs fund, therefore, amounts to about 1 % of the capital value, a proportion which cannot be considered extravagant, and if the repairs are adequately and sufficiently effected it would seen that due economy in the work is certainly exercized.

The following table (XXXIII) gives particulars of the Departmental buildings :—

TABLE XXXIII.

List showing Cost of Buildings belonging to Public Health Department.

Name of building.	Cost.	Total cost.	Remarks.
	L.E.	L.E.	
Central Administration :—			
Central Office	3,395		Old buildings.
Veterinary School	2,331		,,
Director of Stores, Offices	2,430		,,
Workshop, Stores and Stables	2,679		,,
Vaccine Institute	330		1895
Hygienic Institute	1,675		1896
Vaccine stables	560		1898
New Store and trough closet	992		1898
Stables and large shed	504		1902
Serum building	339		1903
Hygienic Institute extension	1,763		1905
Antirabic Institute	2,037		1905
New offices	3,505		1905
Workshop	315		1906
Reconstruction of Central Stores	3,700		1906
		26,485	
Hospitals :—			
Kasr el Aini, existing buildings	60,000		Old buildings.
Sisters' residence	7,000		1890
Lady Cromer Memorial	4,600		1900
Wash-house, etc.	2,134		1903
Electric light installation	1,881		1903
Out-patients Department	580		1906
		76,195	
Hod el Marsud	4,000		Old building.
Modification into hospital	2,000		1902
		6,000	
Abbassia infectious Hospital and Medical Officers Quarters	8,000		1893
Wood huts	1,190		1905
		9,190	
Lunatic Asylum, Abbassia :—			
Existing buildings	21,000		Old buildings.
Army Hospital buildings	20,000		,,
Expenditure on structures and equipment from 1st January 1905 to 1st January 1908	52,873		
Cost of buildings constructed in 1908 and 1909	14,480		
		108,353	
Carried over		226,223	

TABLE XXXIII.

List showing Cost of Buildings belonging to Public Health Department (*continued*).

Name of buildings.	Cost.	Total cost.	Remarks.
	L.E.	L.E.	
Brought forward		226,223	
Abbassia Serum buildings:—			
Original buildings	676		1898
Additional stables and water supply	1,132		1904
Additional quarters	524		1907
		2,332	
Alexandria Hospital.			
Existing buildings	10,052		Old buildings.
Chatby building	10,000		,,
Old Surgical pavilion	6,000		1886
Infectious huts	900		1893
Women's small pavilion	790		1893
Women's large pavilion	3,717		1901
Lunatic block	550		1906
New surgical pavilion	6,025		1907
Administration block	6,338		1907
Director's house	3,000		1909
		47,372	
Port Said Hospital :—			
Existing buildings	1,500		Old buildings.
Large wards	2,500		1886
Infectious Hospital	2,500		1901
New wards and out-patients block	6,930		1902
Lunatic and prisoners' wards	250		1904
		13,680	
Tanta Hospital :—			
Existing buildings	4,712		Old buildings.
Administration block	2,492		1901
Infectious Hospital	1,500		1901
Ophthalmic Hospital	4,125		1907
		12,829	
Mansura Hospital:—			
Existing premises	3,756		Old buildings.
Lunatic and prisoners' wards	630		1907
		4,386	
Zagazig Hospital :—			
Existing buildings	5,000		Old buildings.
Infectious Hospital	500		,,
		5,500	
Damietta Hospital :—			
Existing buildings	10,350		Old buildings.
		10,350	
Damanhur Hospital :—			
Existing buildings	5,693		1894
Infectious huts	360		1900
Additionnal storey on front portion	684		1906
		6,737	
Benha Hospital :—			
Existing buildings	2,711		1895
Infectious hut	660		1900
Infectious pavilion	1,703		1907
		5,074	
Carried over		334,483	

TABLE XXXIII.

LIST SHOWING COST OF BUILDINGS BELONGING TO PUBLIC HEALTH DEPARTMENT (*continued*).

NAME OF BUILDINGS.	Cost.	Total cost.	Remarks.
	L.E.	L.E.	
Brought forward		334,483	
Shebin el Kom Hospital :—			
Existing building	5,507		1898
Room for disinfecting machine	100		1906
		5,607	
Aswan Hospital :—			
Existing buildings	6,940		1904
Desinfecting machine and room for same	100		...
		7,040	
Esna Hospital :—			
Existing premises	800		Old buildings.
		800	
Assiut Hospital :—			
Existing buildings	12,548		1898
Lunatic and prisoners' wards nurse-rooms and addition to out-patients	1,000		1908
Ophthalmic Hospital	10,200		1909
		23,748	
Minia Hospital :—			
Existing buildings	5,650		1901
Infectious pavilion	570		1905
		6,220	
Sohag Hospital :—			
Existing buildings	4,766		1896
Disinfecting room and machine for same	100		1906
		4,866	
Beni Suef Hospital :—			
Existing buildings	4,704		1904
Disinfecting machine and room for same and additions to out-patients	400		1908
Out-patients block, new Stores, etc.	182		1909
		5,286	
Fayum Hospital :—			
Existing buildings	4,966		1894
Disinfecting machine and room for same	100		1906
		5,066	
Suez Hospital :—			
Existing buildings (Town Hospital)	2,000		Old buildings.
Infectious huts	704		1898
Existing premises (new)	10,525		1902
Medical Officer residence	2,500		1903
		15,729	
Mersa Matruh Hospital :—			
Existing premises	1,100		1905
New quarters	500		1908
		1,600	
Carried over		410,445	

TABLE XXXIII.

List showing Cost of Buildings belonging to Public Health Department (*concluded*).

Name of buildings.	Cost.	Total cost.	Remarks.
	L.E.	L.E.	
Brought forward		410,445	
Disinfecting Stations :—			
Damietta Disinfecting Station	532		1896
Mansura Disinfecting Station	527		1896
Zagazig Disinfecting Station	525		1896
Suez Disinfecting Station	599		1896
Tanta Disinfecting Station	537		1900
Cairo, Fum el Khalig Disinfecting Station	921		1900
Cairo, Abbassia Disinfecting Station and Quarters ...	1,478		1893
Port Said Disinfecting Station and Quarters	2,162		1906
New Store for Zagazig Disinfecting Station...	80		1908
		7,361	
Latrines :—			
Ezbekia Garden latrines and Wagh el Birka...	1,105		1905
		1,105	
Drainage :—			
Helwan sulphur baths	800		1905
		800	
Citadel drainage	364		1897
		364	
Scavenging and Watering Service :—			
Stables and Magazines, Bulac	12,000		Old buildings.
New quarters, Bulac	400		1900
Stables and Magazines, Abbassia	1,500		Old buildings.
Stables and Magazines, Giza	1,000		,,
Stables and Magazines, Old Cairo	300		,,
Stables and Magazines, Mataria	...		Hired.
		15,200	
Destructors :—			
Old Cairo Destructor	18,500		
		18,500	
Total		453,775	
Public Health Offices.			
Governorates :—			
Provincial and District Offices } 82 in number.			
Approximate value at L. E. 400 each		32,800	
Grand total		486,575	

or say L.E. 500,000

The following is a list of works now occupying the attention of this Section :—

Projects in hand.

Assiut Ophthalmic Hospital.
Mansura Ophthalmic Hospital.
Alexandria Hospital.—New kitchen, wash-house, stores, etc.
Manfalut Private Hospital.
Delimitation of cemeteries.
Modification, etc., of drainage of mosques.

Projects under study.

Abbassia Lunatic Asylum.—New offices and proposed modification of existing offices.
Cattle shelter at Shellal (Aswan).
New abattoirs at Kus.
Filling Manfalut birkeh.
Alexandria Hospital:—*
- Modification of Surgical Pavilion.
- Modification of Victoria Pavilion.
- Modification of infectious huts.
- Completion of drainage and water supply.

Proposed new hospital at Kena.
Proposed pavilion for 1st and 2nd class patients at Abbassia Infectious Hospital.

Projects requiring early study.

Extension of Hygienic Institute.
Extension of Central Stores.
Abbassia Lunatic Asylum.—New section No. XXX, for 60 patients; new roads; modification and repairs to the old Military Hospital.
Completion of rebuilding of Alexandria Hospital.
Minia Hospital.—New Out-patients Department.
Beni Suef Hospital.—New Ophthalmic Section.
Desinfecting Station at Damanhur.
Disinfecting Station at Bulac.
Mellawi new Public Health office.
Second storey of Central Administration.

---

* These projects are being made by the Public Works Ministry.

PART VI.—LEGISLATION.

(i) Health legislation in general.

Health legislation in Egypt is in an extremely backward state—the amount of legislation is small and a large part of that which exists is useless. Many causes have contributed to this condition which it is not necessary now to discuss, the essential point being that the time has now come to put health legislation on a more satisfactory basis.

In the past, the corresponding French Legislation with very slight modification to suit local conditions has been taken as the model; this procedure has the great advantage that the form being familiar the approval of the Mixed Courts is more easily obtained, but on the other hand the social conditions in Egypt are so different from those obtaining in France that it is felt that in future Egyptian health legislation to be effective should proceed on lines which past experience has shewn to be more suited to the needs of the country.

One point in particular must be noted—the necessity of differentiating between legislation applicable to country districts and that applicable to the towns. In the former, legislation should be of the simplest type, easily understood, and once enacted should be changed as little as possible.

In the towns, both the need and the demand for legislation is practically the same as in Europe. To meet this demand, and at the same time to avoid the disadvantages of sectional legislation, it is proposed that legislation should take the form of Decrees regulating Municipal health questions such as food supply, milk, conservancy, etc.; such Decrees being made applicable by "Arrêté" to Municipal areas on the demand of the Municipal bodies. *It is essential that such a system should be combined with efficient central inspection;* for experience has shown even in those countries most advanced in the theory and practice of decentralized local government that central control is indispensable.

In detail the following health matters urgently require consideration :—

(ii) Practice of medicine.

At present the powers of the State are confined to granting a permit to practice in the country. No power exists for withdrawing this permit even if the medical man is convicted of a serious crime.

For the protection of the public and of the better class practitioner, it is necessary that some legal power be obtained to deal with the worst cases, but it will be necessary to proceed with great caution. The whole subject requires discussion by a representative society of medical men. Probably a solution could be found on the lines of a body of medical assessors appointed by the Consuls from which body two could be chosen by lot to sit with a Government delegate to consider any case arising under the law.

(iii) Lunacy law.

Lunatics are at present confined in the Asylum under the general administrative power vested in the Minister of the Interior. It is necessary that this power should be defined and put upon a legal basis. A draft law is now being prepared on this subject.

(iv) Infectious diseases.

In a country such as Egypt where infectious diseases form so important a part of health work, it will hardly be believed that no legal power exists to enforce disinfection or isolation in cases of infectious disease other than plague and cholera. Such a situation is probably unparalleled in any other civilized country. The promulgation of a Decree to remedy this state of affairs has at last been undertaken and it is hoped that it will be proceeded with without delay.

(v) Laws for regulating the purity of food and drink and the question of unhealthy establishments.

This question has been much discussed, and was in 1907 the subject of one Commission presided over by Coles Pasha, and again recently it has been studied by a second Commission which has just presented its report.

The present Etablissements Insalubres Decree is admitted on all hands to combine a maximum of inconvenience to the public with a minimum of result, and therefore a complete remodelling of the law is essential. There is a general consensus of opinion as to the lines on which this new law should be drafted and it is hoped that a strong drafting committee will be almost immediately appointed to give final form to a substantive proposal.

(vi) Pharmacy law.

The present law was passed in 1904, and has on the whole been most successful. The leading principle has been to enforce on the pharmacists as a whole the best traditions of the profession itself—a number of points have arisen which require modification and it is proposed shortly to deal with these points in an amended law. Here a word is necessary as to the very general objection which exists to amending a recently passed Decree; the necessity for amendment is supposed to indicate careless and ignorant drafting of the original law; this may be so in some branches of legislation, but if the Government undertakes to regulate a complicated profession like that of pharmacy, the legislation, if it is to be efficient must follow the changes and developments of the profession.

In this connection it may be mentioned that the Pharmacy and Poisons laws in France have together undergone no fewer than eighteen amendments or reconstructions in the last twenty years.

(vii) Cemeteries.

The Cemetery Law of 29th January 1894 is fairly efficient as far as the establishment, transfer, and suppression of cemeteries is concerned, but nothing exists in the law regulating

the internal economy of the cemeteries, and as a result the Mohammedan cemeteries are in the larger towns in a most unsatisfactory condition as to cleanliness, upkeep and allotment of burial places.

A scheme of delegation of the internal control of the cemeteries to a Cemetery Committee appointed by the local authorities on the lines of the Alexandria regulations will shortly be brought forward for consideration,

(viii) Decree regulating births and deaths.

A new Project of Decree for regulating births and deaths has been put forward by this Department and is now under consideration.

(ix) Decree regulating the latrines of mosques.

A Project of a new Decree regulating the latrines of mosques was laid before the Legislative Council in 1906, the Council proposed certain amendments, which have been considered and as far as possible accepted. The Decree is now in the hands of the Ministry of Interior.

(x) Amendment of the vidange regulation.

A useful amendment of the Vidange Regulation, 1886, has just been passed (2nd June 1910) empowering the Administration to proceed to the evacuation of a fosse within 24 hours in case of emergency.

Appended is Table XXXIV which summarizes the legal action taken by the Department during the year.

TABLE XXXIV.

Mudiria or Governorate.	Sanitary contraventions drawn up by District Sanitary or Veterinary Inspectors.																Result.				Remarks.
	Against births and deaths decree.	Against vaccination decree.	For illegal practice of medicine.	Against pharmacies and sale of poisons decree.	Against cemeteries decree.	Against Etab. Insal. decree.	Against vidange regulations.	Against excavation regulations	Against enclosing waste land regulations.	Against decisions of Sanitary Commissions.	Re protection of water supply.	Re epidemic and infectious diseases	Other, to the arrêté of 11th May, 1895	Against cholera and plague decree.	Against epizootic diseases.	General, dealt with according to mixed and penal codes.	Total number reported.	Convictions obtained.	Acquittals.	Filed.	Under consideration.	
Cairo	61	154	6	33	...	499	162	...	54	...	...	...	...	...	...	458	1,428	1,052	44	100	232	Besides 1, against a bath.
Port Said ...	4	18	1	...	...	7	24	...	1	1	...	...	...	...	...	...	56	38	4	13	1	
Suez	1	...	...	...	...	22	1	...	...	3	...	13	...	...	...	6	46	37	1	8	...	
Ismailia ...	12	34	...	1	...	...	...	...	...	...	...	...	...	...	...	...	47	33	1	3	10	
Damietta ...	...	2	9	1	...	14	6	...	...	...	...	...	...	...	...	3	35	31	3	...	1	
Kaliubia ...	54	79	13	...	...	46	6	...	...	5	...	52	...	...	...	56	311	219	3	58	31	
Menufia ...	53	182	6	8	53	218	4	12	...	100	...	191	...	22	...	5	854	685	13	98	58	
Gharbia ...	53	322	15	8	1	244	3	49	4	3	...	25	...	...	1	108	836	681	26	60	69	
Dakahlia ...	28	149	9	3	...	105	1	4	...	...	11	53	...	...	...	7	370	322	13	24	11	
Sharkia ...	95	233	11	2	...	19	3	1	...	...	26	64	...	...	...	36	527	398	9	103	19	Including 37 for butchers regulations.
Behera... ...	140	275	8	5	4	78	4	22	6	...	...	115	...	4	11	31	703	535	26	83	59	
Giza	40	135	...	...	...	18	...	2	...	35	2	49	36	...	...	1	318	289	4	6	19	
Beni Suef ...	62	67	...	...	1	11	2	3	...	...	...	22	...	...	...	...	168	160	...	...	8	
Fayum ...	48	115	4	2	...	34	...	5	...	1	...	12	22	8	35	...	286	232	5	40	9	
Minia	91	354	3	2	...	85	...	9	1	...	...	13	...	...	...	39	597	516	5	31	45	
Assiut ...	121	283	6	3	...	359	13	39	9	65	...	7	2	5	...	84	996	771	25	45	155	
Girga	49	81	1	2	2	79	1	14	...	80	...	3	...	...	...	4	316	269	15	21	11	
Kena	174	156	8	4	...	70	...	1	...	94	...	44	1	1	...	7	560	481	25	28	26	
Aswan... ...	62	37	...	...	...	2	...	...	...	...	...	...	...	...	...	...	101	58	3	11	29	
Total...	1,148	2,646	99	74	61	1,910	230	161	75	387	39	663	61	40	47	845	8,517	6,805	608	722	793	

CONCLUSION.

From the foregoing it will be readily realized how various and diverse are the duties which the Department is called upon to fulfil and the conditions under which the work is required to be done. Under these circumstances, it must not be expected that progress can be either universal or uniform ; but, having regard to existing social and political conditions, some satisfaction may be fairly felt with the indisputable advance which has of recent years been made in the domain of what may be termed " public medical assistance," a branch of the public service which is more intimately associated with, and more immediately within the personal influence of the members of the Department. Thus it is possible to register a very definite progress in both the quality and amount of medical aid afforded to the mass of the peasantry, the gradual breaking down of popular reluctance to have recourse to Government hospitals and dispensaries, the general improvement in the professional attainments of the more recent generation of young medical officers, the widening sphere of utility of the ophthalmic service (for which, in the beginning, failure was freely prophesied), the extraordinary avidity with which the people seize on the ophthalmic aid offered them, and, lastly but by no means least, the improvement in the organization and material for dealing with infectious disease which has taken place under the stress of the continued presence of plague in the country.

If progress in these directions can be demonstrated, the fact should certainly serve as encouragement to the belief that similar progress may, with suitably designed methods and means, be realized in other fields of the Departmental sphere. The Egyptians are eminently a people of tradition and of habit, and it is these factors which determine the direction in which any given movement shall advance with success.

The calling of " medicine " in this country has a tradition behind it as old as the Pharaohs, and is one which appeals to a considerable section of the educated youth; the carrying out of routine work of the nature of " drill " appeals to another section of the community, and the faculty of acquiring " drill " methods is a marked one, as the experience of the Army well illustrates.

The calling of the " sanitary expert " is, however, a very modern one, for, though the recognition of hygienic rules is at least as old as civilization, is reproduced in the Mosaic law and, in its ancient teaching, is incorporated in the Mohammedan ritual of to-day, the methods and the scientific acquisitions on which they are based are of the most modern character. The scientific Medical Officer of Health is indeed a most recent product even in those countries which are furthest advanced in modern hygiene, and it cannot, therefore, be reasonably expected that the mass of the Egyptian Medical Officers will speedily acquire the scientific methods of these more advanced countries. Meanwhile, it is satisfactory to be able to state that some exceptions to this rule do occur, and it is believed more will develop in the future ; to these every encouragement is given and will be given so that they may have every opportunity to make the most of their industry and their talents.

The application of these facts to the problems in hand and to the special conditions of administration in this country should indicate the means by which satisfactory solutions will most probably be realized.

There are three broad reasons why it is desirable that the country should be endowed with a strong and well organized State Health Authority, based on modern requirements; they are, firstly, those reasons connected with geographical position, which renders the organization of a sound sanitary defence essential; secondly, those reasons of an economic nature based on the fact that the able bodied population is (because of its deficiency in numbers and the presence of a large element of preventible physical incapacity) inadequate to the development of the natural resources of the country; and, thirdly, reasons of a social order connected with the progressive development of the country, its general administration, the growth of municipal institutions, the higher standard of living and the creation of new requirements.

If such an object is to be pursued, it is probable that efforts should, for the present, be concentrated on the following three measures :—

(1) A sound organization of the Department throughout, embracing a scheme of sanitary defence, descending to the districts and ultimately even to the villages.

This organization should be of no rigid type, nor conceived on narrow lines, but should be as elastic and adaptable as the duties of the Department are various and the material dealt with is diverse, and the responsibility of administration (but not necessarily the executive power) must lie with the departmental officials.

(2) The elaboration of a Public Health law established on a broad basis, which shall on the one hand clearly distinguish between uniform *compulsory* regulation and *optional* powers granted to local authorities; and also on the other between measures essential to urban communities and those which it is desirable to enforce in the interests of a rural population.

(3) The organized extension of research work in connection with the recognized diseases of the country, their origin, causes and methods of communication in men, animals and insects.

The programme sketched above is not an ambitious one at this stage of British Administration in Egypt. The first requirements for its realization are naturally of a financial order, but much could be done, and is merely waiting to be done, without any undue strain on the Treasury. The means are ready and to hand, and the Department counts on the approval and co-operation of the Government in order that a strong impetus may be given towards the further development of an organized service so vital to the interests of this country.

W. P. G. Graham.
Director-General.

Cairo, June 30th, 1910.

Imp. Nat. 2511-1910-320 ex.